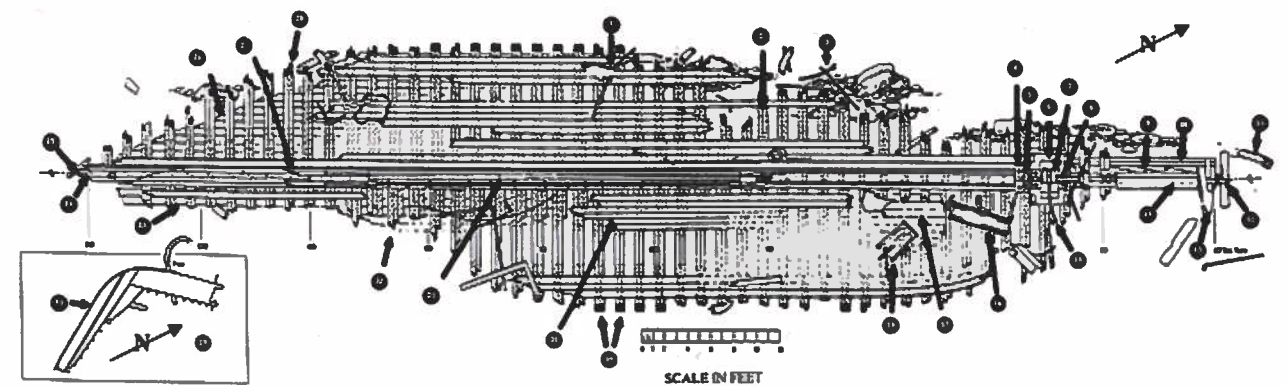


# WRECK OF THE STEAM BARGE *ADVENTURE*: AN ARCHAEOLOGICAL INVESTIGATION IN LAKE ERIE AT KELLEYS ISLAND, OHIO

by  
**C. Patrick Labadie**  
and  
**Charles E. Herdendorf**



KEY										
1 CENTERBOARD WINCH	11 TWO FUTTOCKS FORMING ONE FRAME	21 PIPES	31 FLY WHEEL	41 ECCENTRICS	51 ENGINE BED (OAK)	61 CRANKSHAFT (JOURNAL)				
2 BEARING BLOCKS	12 DEAD WOOD	22 KEEL	32 RUDDER SHOE	42 PROPELLER	52 STERN POST	62 SHAFT LOG	72 CONNECTING ROD			
3 CONDENSER	13 BOTTOM PLANKING EXPOSED BY FIRE DAMAGE	23 ENGINE FRAME	33 THICK STRAKES (4")	43 CEILING PLANKS						
4 CENTERBOARD & TRUNK	14 THREE FUTTOCKS FORMING A REINFORCED FRAME ADJACENT TO CENTERBOARD TRUNK	24 OUTER PLANK	34 RIDER KEELSON							
5 BOW	15 BOTTOM (OUTSIDE) PLANKING	25 KEEL & KEELSONS	35 IRON KNEE	45 BOW STEM	55 STEM IRON					

**Great Lakes Historical Society**  
**Peachman Lake Erie Shipwreck Research Center**  
**Technical Report No. 1**

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AN ARCHAEOLOGICAL INVESTIGATION  
IN LAKE ERIE AT KELLEYS ISLAND, OHIO**

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**April 2004**

**Wreck of the Steam Barge *ADVENTURE*:  
An Archaeological Investigation in Lake Erie at Kelleys Island, Ohio**

**C. Patrick Labadie and Charles E. Herdendorf**

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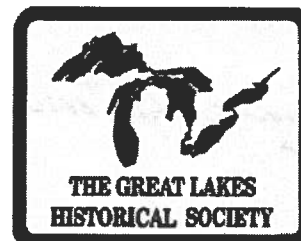
The Peachman Lake Erie Shipwreck Research Center (PLESRC), located on the grounds of the Inland Seas Maritime Museum in Vermilion, Ohio, is a component of the Great Lakes Historical Society. The PLESRC vision is to be the most comprehensive source of shipwreck information for Lake Erie and its environs.

Charles E. Herdendorf, Ph.D.  
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Capt. Wayne E. Bratton  
Chair, PLESRC Subcommittee

**Cover Illustration and Plate 1:**

*Site Plan of Steam Barge ADVENTURE (1875-1903) Kelleys Island, Ohio*. Dive slate *Guides to Lake Erie's Historic Shipwrecks*, published in 2002 by the Great Lakes Historical Society in cooperation with the Ohio Sea Grant College Program (OHSU-GS-020).



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## WRECK OF THE STEAM BARGE *ADVENTURE*: AN ARCHAEOLOGICAL INVESTIGATION IN LAKE ERIE AT KELLEYS ISLAND, OHIO

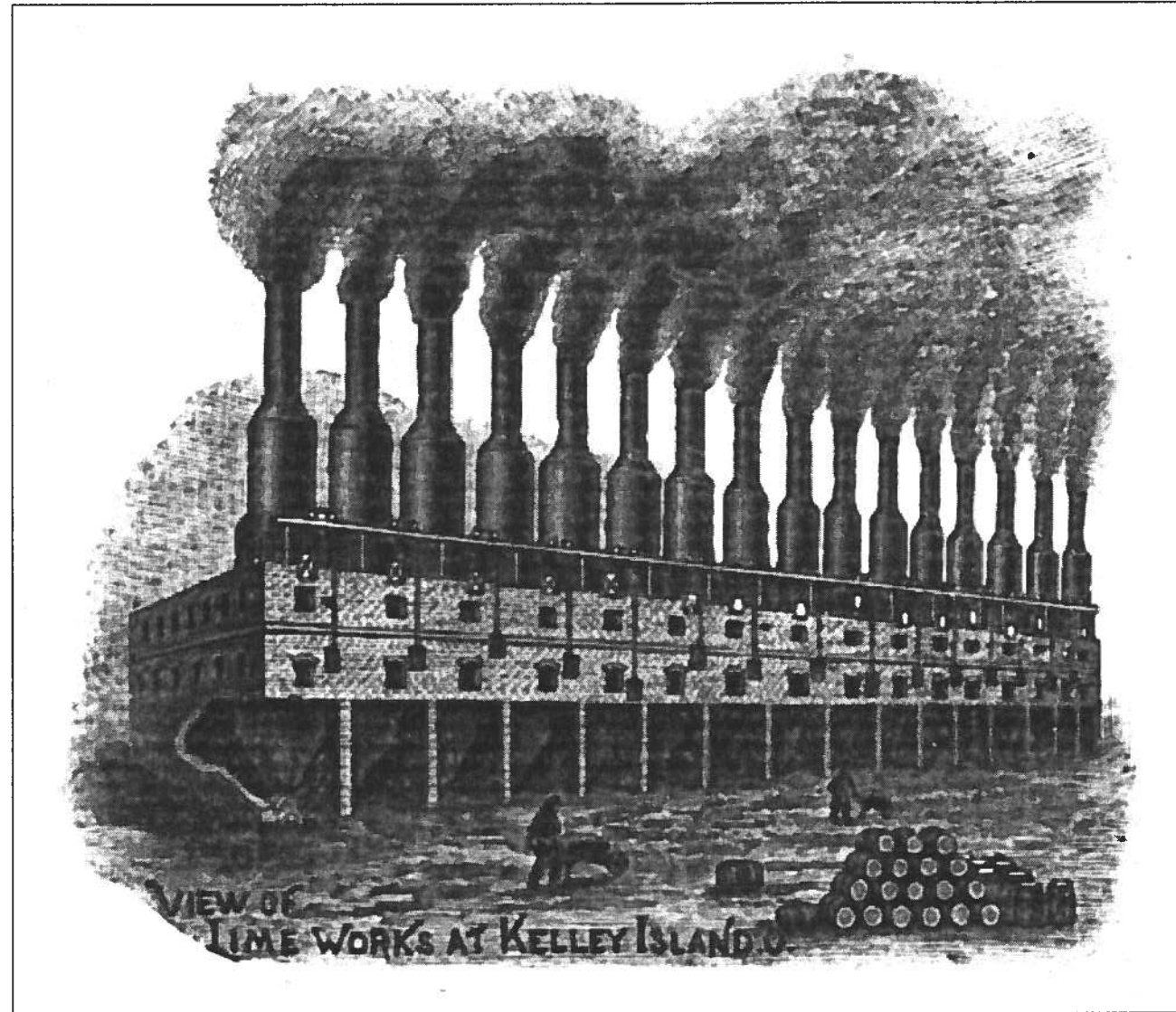
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### ABSTRACT

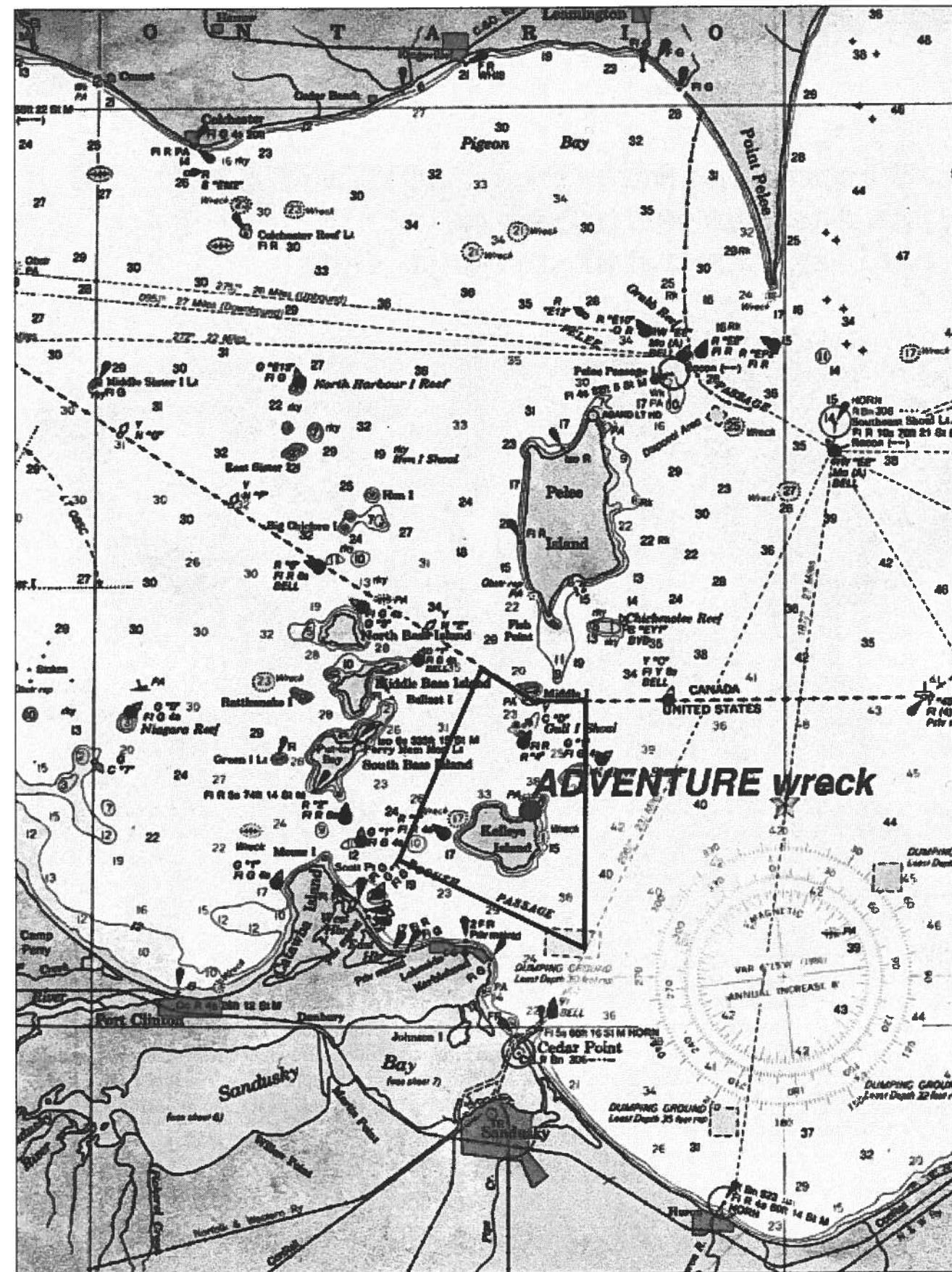
This paper describes the results of historical and archaeological investigations into the shipwreck site of the *ADVENTURE* (Ohio State Archaeological Site #33ER481) and related facilities of the Kelley Island Lime & Transport Company (KIL&T Co.) at the North Bay quarry complex (Site #33ER336) on Kelleys Island, Ohio. Underwater and terrestrial archaeological research into these components of the Kelleys Island limestone industry is combined to provide significant insight into an important facet of Ohio's industrial history. The paper also provides an opportunity to showcase efforts to develop a recreational diver program designed to assist in the inventory of Lake Erie's underwater cultural resources.

Kelleys Island is the remnant of a Devonian limestone reef that once formed a divide between preglacial river valleys. The limestone found on Kelleys Island occurs in thicker beds, cuts easier, and makes better lime, flux stone, and building stone than the strata found elsewhere in the region. The potential of the limestone industry prompted the Kelley family to purchase the island in the 1830s and commence quarrying. By the 1880s, KIL&T Co. consolidated the holdings of the island's smaller operations, becoming the island's largest employer, and by the turn of the century, the largest producer of lime products in the world.

Virtually all of the stone products were transported from Kelleys Island by merchant steamers and sailing vessels. One of these, the steam barge *ADVENTURE*, met a disastrous end in 1903 while engaged in the trade. The remains of this vessel in North Bay of Kelleys Island provide insight into the maritime aspects of the lime industry during its heyday. Archaeological investigations of this shipwreck, undertaken as part of a nautical archaeology workshop offered at Firelands College, Bowling Green State University in 1997, are supported by archaeological investigations of portions of the upland quarry facility, undertaken as part of the mitigation efforts associated with the construction of a new boat ramp at nearby Kelleys Island State Park (Myers et al. 1992; Pape 1988).



Woodcut of Kelley Island Lime & Transport Company lime kilns at North Bay quarry complex, circa 1888; showing stack of wooden barrels on stone floor at base of kilns (from Nichols 1888:23, courtesy of Cleveland Public Library). This illustration was used on Kelley Island Lime & Transport Company letterhead in the 1890s.



The Lake Erie Islands, showing Kelleys Island Port Authority boundary (NOAA chart no. 14842).

INTRODUCTION

Underwater cultural resources, the physical remnants of centuries of both prehistoric and historic human activity, are a unique, priceless, and endangered Great Lakes resource (Vrana and Mahoney 1993:3). The cold, fresh waters of the Lakes have preserved a diverse assortment of cultural materials. Lake Erie contains hundreds of shipwrecks and other cultural resources (e.g., wharves and docks, navigational structures, remains of now submerged land sites, and prehistoric artifacts). These cultural artifacts provide important material evidence of the regions' maritime history and the cultural development of the region. Boats and ships are especially important, being the largest and most complex objects or machines produced before the Industrial Revolution of the 19th century. Vessels formed the "leading edge" of technology of most pre-industrial societies (Muckelroy 1978:3). They created seafaring social groups, with a variety of economic, political, and religious consequences. The course of human history owes much to maritime activities. In many societies, including the early European settlements of the Great Lakes region, seafaring and fishing folk formed a distinct subculture alongside urban and rural groups (Lloyd and Mullen 1990:125).

A ship undertaking a voyage leaves absolutely no imprint on the archaeological record if all goes as planned. At the end of the voyage the material evidence will be dispersed when the cargo is sold, the crew and passengers go their separate ways, and the ship is taken on a new enterprise. Only when disaster strikes during the voyage, and the whole unit—ship, cargo, and shipboard community is deposited on the lakebed, is there any chance of a permanent material record that is recoverable by archaeological techniques (Muckelroy 1978:7). When a ship sinks it is usually a fully operational system, containing all of the objects necessary for the vessel to function in a normal way. Thus, underwater archaeological sites are unlike most land sites which slowly decay after abandonment, such as dwellings or manufacturing facilities from which most of the furnishings, tools, and utensils are removed at the time of abandonment. A shipwreck, at the time of sinking, typically contains all of the equipment normally onboard an operating vessel of its time period.

A ship is an organized assemblage of objects and materials designed to perform certain functions.

However, when she is holed, capsized, beached, or burned this organization begins to break down. She may sink to the lakefloor intact or arrive in pieces. Either way, over decades or centuries, the waves, currents, and aquatic organisms tend to break up and scatter the remains of the vessel or cover them with sediment. Because archaeologists are ultimately interested in not only the wrecks, but in the ships they once were, their principal task is untangling such disorganization.

Maritime or nautical archaeology is the scientific study, through surviving material evidence, of all aspects of seafaring: ships, boats, and their equipment; cargoes or passengers carried on them and the economic system within which they operated; their officers and crew, especially utensils and other possessions reflecting their specialized lifestyle; and shore-based navigational and support facilities. Underwater archaeology is a broader subject, dealing with the study of submerged cultural objects, regardless of whether or not the objects were produced or used by a seafaring culture.

The study of seafaring can be approached from three avenues: (1) historical, (2) ethnological, and (3) archaeological. The historical approach is concerned with uncovering and interpreting surviving documentary evidence for past events, which seeks to understand not only the precise course of events but also the reasons, causes, or motives behind them. The ethnological approach involves the systematic study of surviving indigenous (local) practices, traditions, and customs within the specialized seafaring or fishing communities, particularly in the context of social forms and economic systems. The archaeological approach consists of the study of objects which have survived from, on, and around the sea or large lakes, and from them derive insight into the people and societies which produced them. *Ships of the Great Lakes* (Barry 1996), *Lake Erie Fishermen: Work, Tradition, and Identity* (Lloyd and Mullen 1990), and *Ships and Shipwrecks of the Americas: A History Based on Underwater Archaeology* (Bass 1988) are published examples of these three approaches. The information and ideas contributed by these various approaches are mainly complimentary and their objectives are the same, only the sources of information tapped are different. Thus, in attempting to answer research questions about

seafaring, all three sets of evidence should be considered, and critically integrated within the study conclusion.

Stone quarries on Kelleys Island in western Lake Erie date back to around 1830. For over a century they yielded high-quality limestone that left the island in several forms: building stone for coastal construction projects, flux stone for steel mills, and burned stone for agricultural lime and other lime products. Eventually Kelleys Island became the largest producer of lime in the world (Myers et al. 1992:21). Virtually all of these stone products were transported from the island by merchant steamers and sailing vessels. One of these vessels, the steam barge *ADVENTURE*, met a disastrous end in 1903 while engaged in this trade. The remains of this shipwreck in the North Bay of Kelleys Island provide insight into the maritime aspects of the lime industry during its heyday.

Documentation of this shipwreck was undertaken as part of a nautical archaeology workshop offered at Firelands College of Bowling Green State University

in September and October 1997 (Labadie and Herdendorf 1998:1-43). The workshop, *Shipwreck Archaeology for Recreational Divers*, was organized by the Ohio Maritime Advisory Council, an advisory body to the Ohio Department of Natural Resources and the Ohio Historical Society. This body, appointed by the Governor of Ohio, is charged with assisting these agencies in their mission to preserve and promote the enjoyment of Lake Erie's cultural resources.

Thus, the objectives of this paper are to describe the shipwreck site of the *ADVENTURE* and to document the history of this vessel, particularly in the context of the flourishing limestone industry of her era. The *ADVENTURE* is interesting for study purposes in that she has characteristics of two classes of Great Lakes vessels. Built as a schooner (Figures 1 and 2), she was later converted to a steam barge (Figure 3). The *ADVENTURE* also demonstrates the critical maritime transportation link between the Kelleys Island source and mainland users of limestone commodities. The importance of this maritime link will be explored through the example of this vessel.

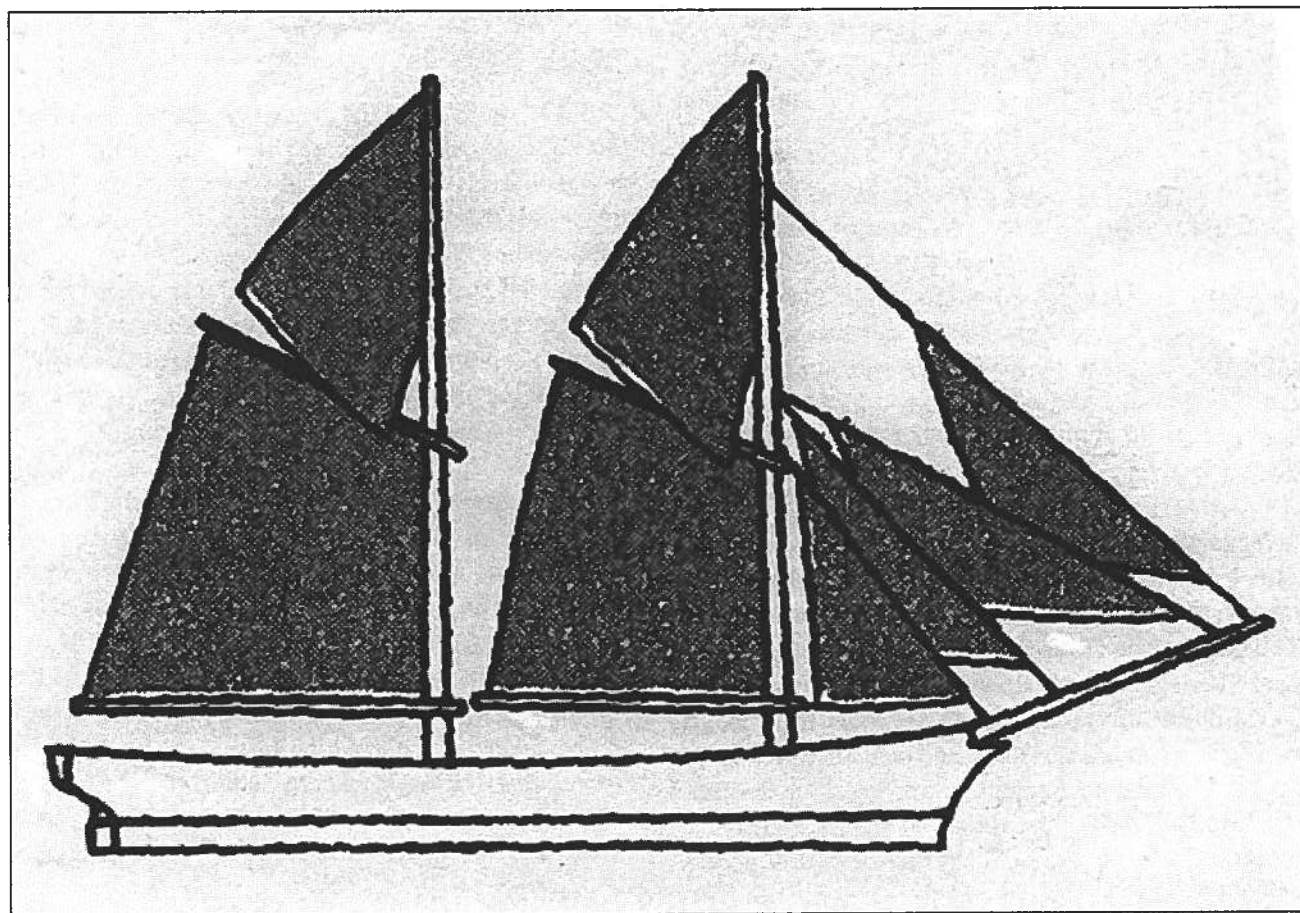


Figure 1. Rigging plan for a typical two-masted schooner approximating the *ADVENTURE*'s size and shape (modified from Kihlberg 1963:132).

## THE *ADVENTURE* AS A REPRESENTATIVE OF VESSEL CLASSES

### SCHOONER *ADVENTURE*

The *ADVENTURE* was built as a schooner in 1875 at Detroit, Michigan by well-known shipbuilder John Oades. She was a conventional, two-masted schooner with straight stem and a square transom stern. Like hundreds of her contemporaries, she was fitted with topmasts, a long bowsprit, and a centerboard, and she undoubtedly carried foresail and main, two gaff topsails, a forestaysail, and two or three foresails or "jibs" (Figure 1). She may also have used the triangular "raffee" on her foremast which was characteristic of many Great Lakes sailing craft of her era (Kihlberg 1963:74,75). Her crew would have consisted of three or four men and a cook.

The *ADVENTURE* measured 104 feet in length, 24 feet beam (width), and 8 feet depth of hold. According to the laws of the U.S. Customs Department, official length was measured on deck from the inside of the stem to the after side of the sternpost; beam was taken to the outside of the planking at the widest part of the ship, and depth was measured from the upper side of the deckbeams amidships to the upper surface of the ceiling (inner) planking in the hold. Her register tonnage was 148.97 gross tons and 141.53 net (a "register" ton is equal to 100 cubic feet of enclosed space, and does not represent a measure of weight). The enclosed space below decks measured 139.86 register tons and she had a "trunk cabin" on her deck aft which measured 9.11 register tons. The ship's weight capacity would have been approximately 250 tons of cargo (equivalent to 175,000 board feet of lumber).

*ADVENTURE*'s construction appears to have been typical of wooden ships of her day in most respects (Figure 2). She was built entirely of white oak and had closely-spaced transverse frames, all connected by a longitudinal backbone of heavy oak keelsons. Inner and outer planking was 3-inch thick white oak. The whole structure was strengthened by bands of heavier planking, called "thick strakes," running the entire length of the hull under the deckbeams and along the bilges on both sides. The hull of such vessels was commonly stiffened further by the use of large tamarack brackets or "knees" under each deck beam where the beams met the vessel's sides (although it has not been possible to confirm the use of knees in the *ADVENTURE* because so much of the

upper hull structure was destroyed in her fire). The ship was iron-fastened, with  $\frac{3}{4}$ -inch and 1-inch iron "treenails" in her frames and smaller  $\frac{5}{8}$ -inch round and  $\frac{3}{8}$ -inch square nails in the planking.

The *ADVENTURE* was among the smaller Great Lakes schooners. There were larger and more numerous ones called "canallers" and still larger schooner craft. Canallers measured approximately 145 feet in length, 25 feet in breadth, and 10 feet depth of hold. Several hundred canallers plied the Lakes. These vessels were tailored to the dimensions of the old (second) Welland Canal (1845 to 1883), connecting Lakes Erie and Ontario. The Great Lakes merchant fleet of the mid-1870s included some 2,000 schooners in all, nearly half of which were canallers (Barry 1996:123,124; Labadie 1989:19-22; Mills 1910:183-186). Schooners larger than canal-size were used principally in the lucrative grain and iron ore businesses or in the Chicago lumber trade, while canallers were employed largely in the Lake Ontario and Upper Lakes traffic. The smaller sailing craft, such as the *ADVENTURE*, were more often engaged in the "itinerant" trades, taking advantage of whatever small cargoes became available at smaller (and often shallower) ports. The largest sailing vessels in 1875 were 200 feet long, although a few schooner-barges exceeded that length; these latter craft were principally used as towbarges (Barkhausen 1947:10).

### STEAM BARGE *ADVENTURE*

After serving as a sailing vessel for two decades, the *ADVENTURE* was rebuilt as a screw steam barge at Sandusky, Ohio in 1897 by Henry D. Root of nearby Lorain. The conversion seems to have been done on property owned by David Dussault. Dussault operated a sand and gravel business on the Baltimore & Ohio Railway dock at the foot of Warren Street, and on another dock at the foot of Meigs Street in Sandusky. Secondhand machinery was used for the ship's conversion. Root was very highly regarded in marine circles, having operated a shipyard at Lorain since the early 1850s. He is credited with building some 49 vessels and rebuilding several others. Building all manner of Great Lakes craft, principally schooners in the early years and fish tugs after 1890, he operated a shipyard until 1908.

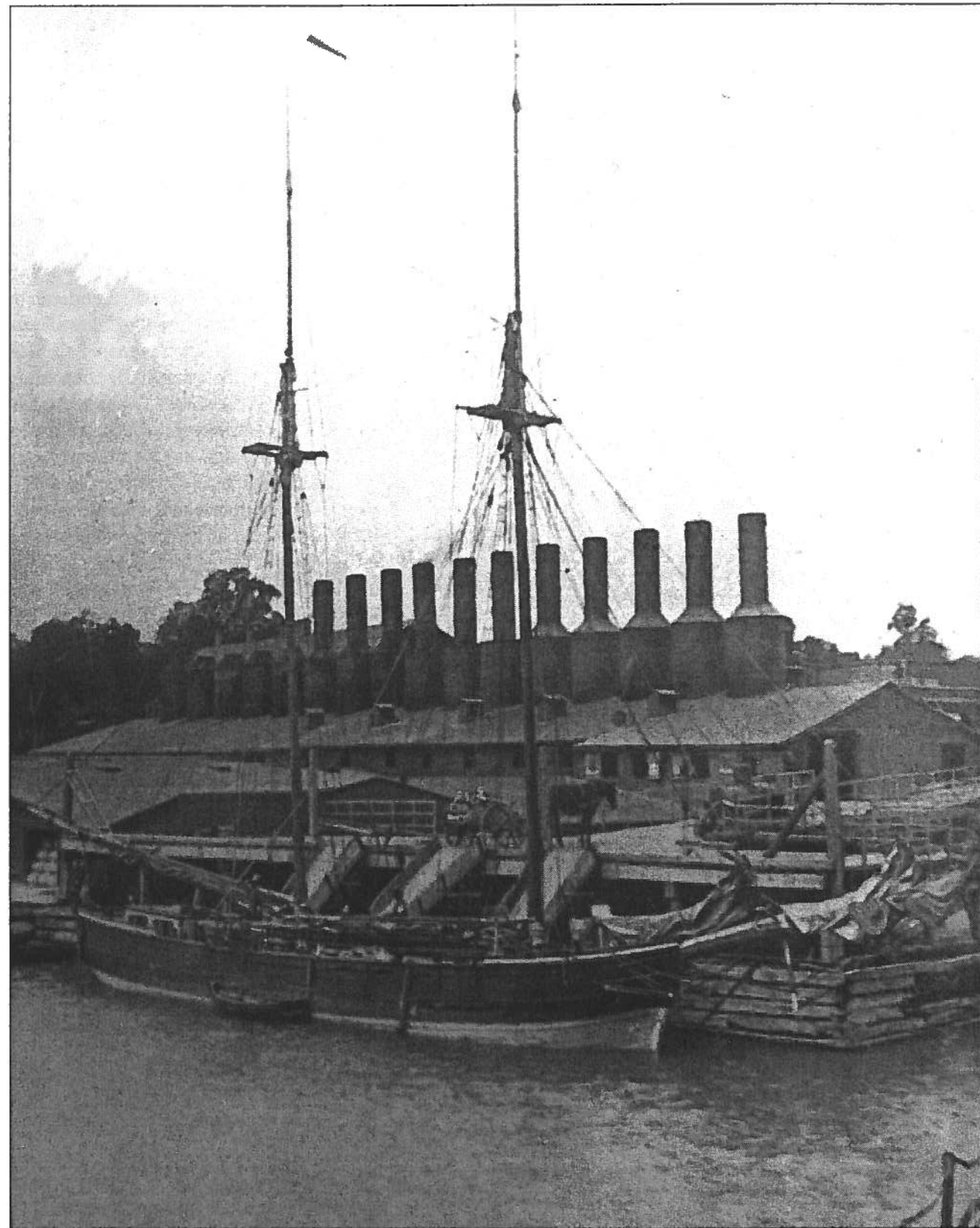


Figure 2. Kelley Island Lime & Transport Company's lime dock and kilns at North Bay quarry complex, circa 1890 (Capt. Frank E. Hamilton Albums, Charles E. Frohman Collection, Rutherford B. Hayes Presidential Center at Fremont, Ohio). Wooden schooner at dock is of a design similar to the ADVENTURE when she was a schooner; wooden barrels stacked in warehouse at stern of schooner were used to ship lime.

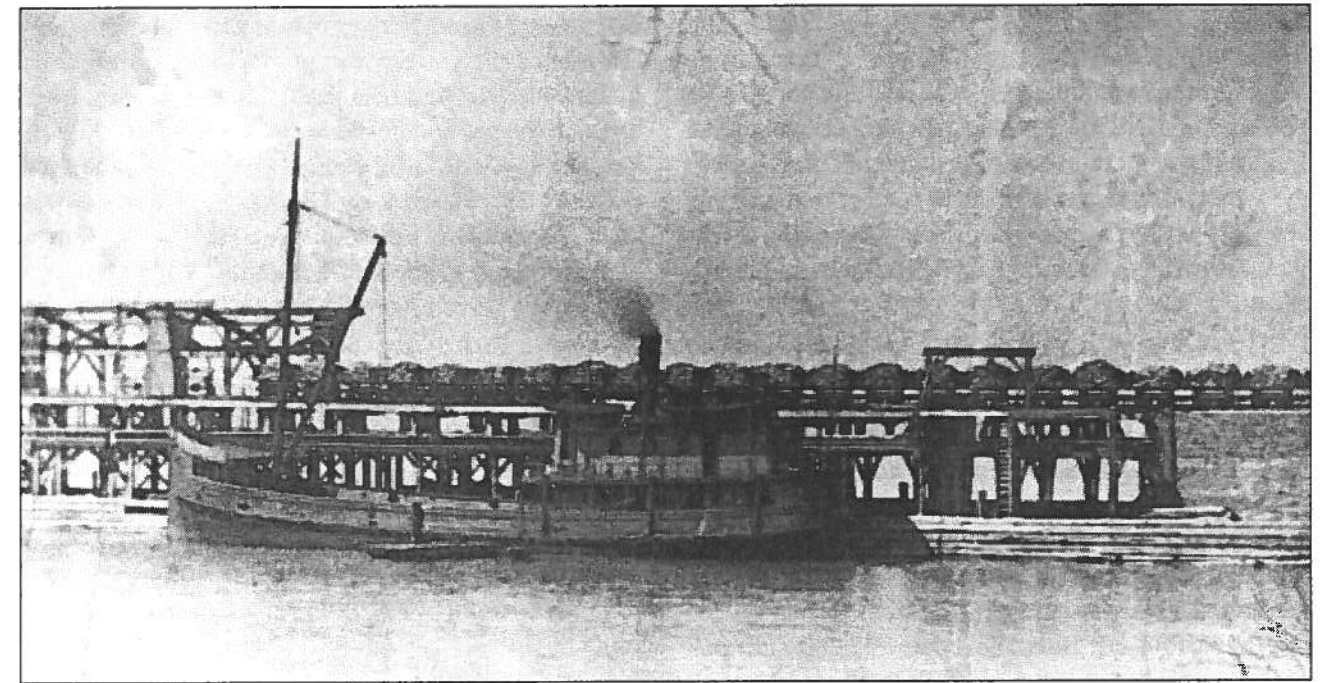


Figure 3. Steam barge ADVENTURE at North Bay dock, Kelleys Island, Ohio, circa 1903 (courtesy of Great Lakes Historical Society).

Rebuilding of the ADVENTURE from a schooner to a steam barge was accomplished by reconstructing and rounding the ship's square stern and installing a boiler, engine, tailshaft, propeller, and rudder. Simpler tasks included removal of the ship's bowsprit and her after (main) mast, relocating the foremast, and erecting a small forecastle at the bow. A cabin was also constructed on a raised poop deck at her stern (Figure 3). Following her rebuilding, *Inland Lloyds Vessel Register* (1897) listed the vessel's insurance evaluation as \$6,000.

Essential machinery consisted of a small, single-cylinder high-pressure vertical steam engine salvaged from the steam barge *HANDY BOY* and a boiler from the tug *MYRTLE* (Figure 4). The engine, with a 16-inch cylinder and an 18-inch stroke, had been fabricated in 1881 by Phoenix Iron Works at Port Huron, Michigan, and used in the *HANDY BOY* until that craft was destroyed by fire at Huron, Ohio on September 4, 1888. The *HANDY BOY* was very nearly the same size as the ADVENTURE, measuring 104.6 x 25.9 x 7.5 feet, and 136 gross tons and was last owned by the Kelley Island Lime & Transport Company. The boiler used in the ADVENTURE came out of the 50-foot tug *MYRTLE*, which was built in 1875 at Black River [Lorain, Ohio] and owned by Fred Groch, the same man who purchased an interest in the ADVENTURE shortly before her 1897 rebuilding. Although the tug

was abandoned at Sandusky around 1892 (Wendt 1984:129), she may have been out of service for some time previous to that date: the *Marquette, Michigan Daily Mining Journal* advertised on December 17, 1887: "The tug *MYRTIE* [sic] of Sandusky - for sale cheap; in first-class condition. Write to Fred Groch, Sandusky, for particulars." According to the 1902 edition of *Beeson's Marine Directory*, the boiler was the firebox type and measured 5 1/2 feet in diameter and 12 feet in length; its manufacturer is unknown.

Following her 1897 reconstruction for owners Robinson and Groch, the ADVENTURE measured 108 feet in length, 24 feet beam, and 8.3 feet depth of hold. Her draft would have been about 8 feet aft and 6 or 7 feet forward. Her register tonnage was changed to 141.72 gross tons and 95.37 net tons. Because of the space taken up by her machinery and coal-bunkers, the ship's cargo capacity was somewhat reduced. No revised capacity figure has yet been found, but it may be estimated from 170 to 200 tons or approximately 150,000 board feet, based on a comparison with similar vessels. The 1902 edition of *Inland Lloyds Vessel Register* noted that she was approved for deck loads of lumber up to 7 1/2 feet high.

Steam barges were developed on the Great Lakes following the Panic of 1857, when low freight rates and an overdeveloped merchant fleet drove most vessel

owners out of business. Around 1862 a Buffalo ship owner took idled passenger steamers, made huge barges of them, and used large tugs to tow them from port to port (Mills 1910:186-188). He reasoned that a freight steamer could be designed which would serve the same purpose: towing barges and at the same time carrying a cargo on its own deck—the steam barge was the result (Labadie 1989:25-28; Labadie and Murphy 1987:55-57; Mills 1910:188-190). The *TRADER*, built at Marine City, Michigan in 1865, is believed to have been the first steam barge.

Steam barges, at times called “lumber hookers,” were single-decked steamships whose basic hull construction differed little from contemporary schooners, except that they were self-propelled, with boilers and engines, and had cabin accommodations necessary for larger crews. The earliest steam barges had their cabins aft as did the *ADVENTURE*, although the larger steam barges which evolved after 1880 often had a pilothouse and some of their cabins on a raised forecabin at the bow; this feature was advantageous in larger craft since it improved visibility for the master and wheelsman. Most vessels of this type ranged between 90 and 175 feet in length with capacities from 150,000 to 1,000,000 board feet (up to 800 tons) of lumber. Between 1865 and 1910 there were 800 steam barges built on the Great Lakes (Labadie 1982). This type of vessel was adopted in the Pacific Northwest as the lumber industry moved there in the late 1800s, where it was referred to as a “steam schooner.”

These sturdy vessels carried their cargoes on deck as well as below, but because their below-decks capacity was limited, they were particularly suited for products which could be exposed to the weather and piled high on deck. These products included lumber, coal, sand, stone, or barreled salt. Steam barges were also good money-makers because they had the horsepower to tow two, three, or more loaded barges behind, multiplying their payloads several fold on any given trip. Some of the more powerful “hookers” routinely towed six barges back and forth between Saginaw, Michigan and Toledo, Ohio or Buffalo, New York during the 1870s and 1880s. The relatively small engine and boiler inherited by the steamer *ADVENTURE* would not have been sufficiently powerful to tow more than one or two barges.

Steam barges proved essential to the development of the lumber industry on the Great Lakes, providing

access and cheap transportation for forest products. Moreover, they were the prototypes for the Great Lakes’ unique “bulk freighters” which soon followed them in the grain and iron ore trades and persist to the present day with little change (Labadie and Murphy 1987:57-60). Steam barges disappeared not long after the collapse of the lumber industry in the Great Lakes region around 1920, but their double-decked descendants have served America’s economy for more than 130 years by hauling mountains of grain, coal, and iron ore inexpensively. The bulk freighters of the Great Lakes are known the world over for their efficiency and economy, and they are direct descendants of modest little steam barges like the *ADVENTURE*.

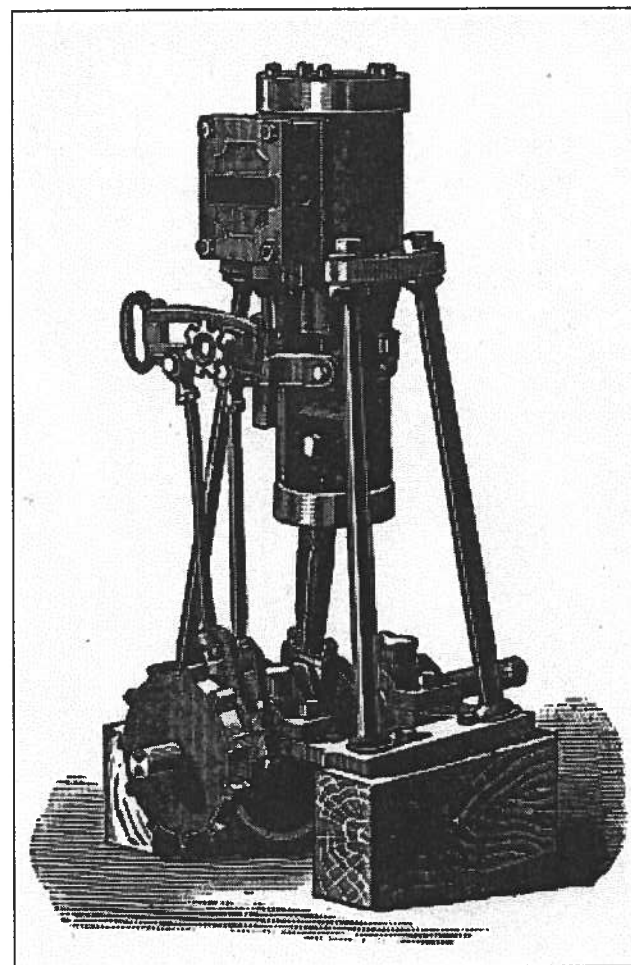


Figure 4. Small, single-cylinder high-pressure vertical steam engine similar to the one believed to have been salvaged from the steam barge *ADVENTURE* (courtesy of Great Lakes Historical Society).

### *ADVENTURE*: OWNERSHIP, SERVICE HISTORY, AND LOSS

The initial enrollment was issued to the schooner *ADVENTURE* October 1, 1875 at Detroit, Michigan by special surveyor J. E. Parry. It describes the vessel as having one deck and two masts, plain head and a square stern, with measurements 104 x 24 x 8 feet, 148.97 gross tons, and 141.53 net tons. The official number assigned her was 105567.

The ship’s official documents indicate that she was built for enterprises of the John Oades family; for the first two and a half years of her existence, she was owned by John Oades (<sup>3</sup>/<sub>4</sub> interest) and son Walter H. Oades (<sup>1</sup>/<sub>4</sub> interest). Her first master was George H. Collins. In 1876, the Board of Lake Underwriters assessed the value of the *ADVENTURE* at \$8,000 (Figure 5). It may be speculated that Oades used the craft to transport oak from Ohio ports to his Detroit shipyard property, although no substantiating evidence has yet been found. John Oades constructed 14 ships on the Detroit waterfront between 1868 and 1890, but he is best known for the 36 vessels he built at Clayton, New York between 1846 and 1865. The earlier vessels included some of the largest and finest passenger

steamers on Lake Ontario, along with many barks and schooners. Oades was born at Sacketts Harbor, New York in 1815 and came to Clayton in the early 1840s. He relocated to Detroit in 1865, where he superintended the highly successful Campbell & Owen shipyard before resuming business on his own two years later (Wright 1969:94,95).

Enrollment documents dated April 2, 1878 (Detroit, Michigan) show a change of ownership to Edward Cunningham (<sup>1</sup>/<sub>2</sub>) and F. B. Wallace (<sup>1</sup>/<sub>2</sub>). Both men were from Detroit, and Edward Cunningham was listed as master. Little is known of the schooner’s activities during this time. *Inland Lloyds Vessel Register* for 1884 lists the *ADVENTURE* with a valuation of \$5,000. Another enrollment was issued at Detroit on April 13, 1886, showing a change of ownership to Edward Cunningham (<sup>1</sup>/<sub>4</sub>), F. B. Wallace (<sup>1</sup>/<sub>2</sub>) and J. E. Wallace of Chicago, Illinois (<sup>1</sup>/<sub>4</sub>); Edward Cunningham continues to be given as master. The 1886, 1888, and 1890 editions of the annual *List of Merchant Sailing Vessels of the United States* list Detroit, Michigan as her home port.

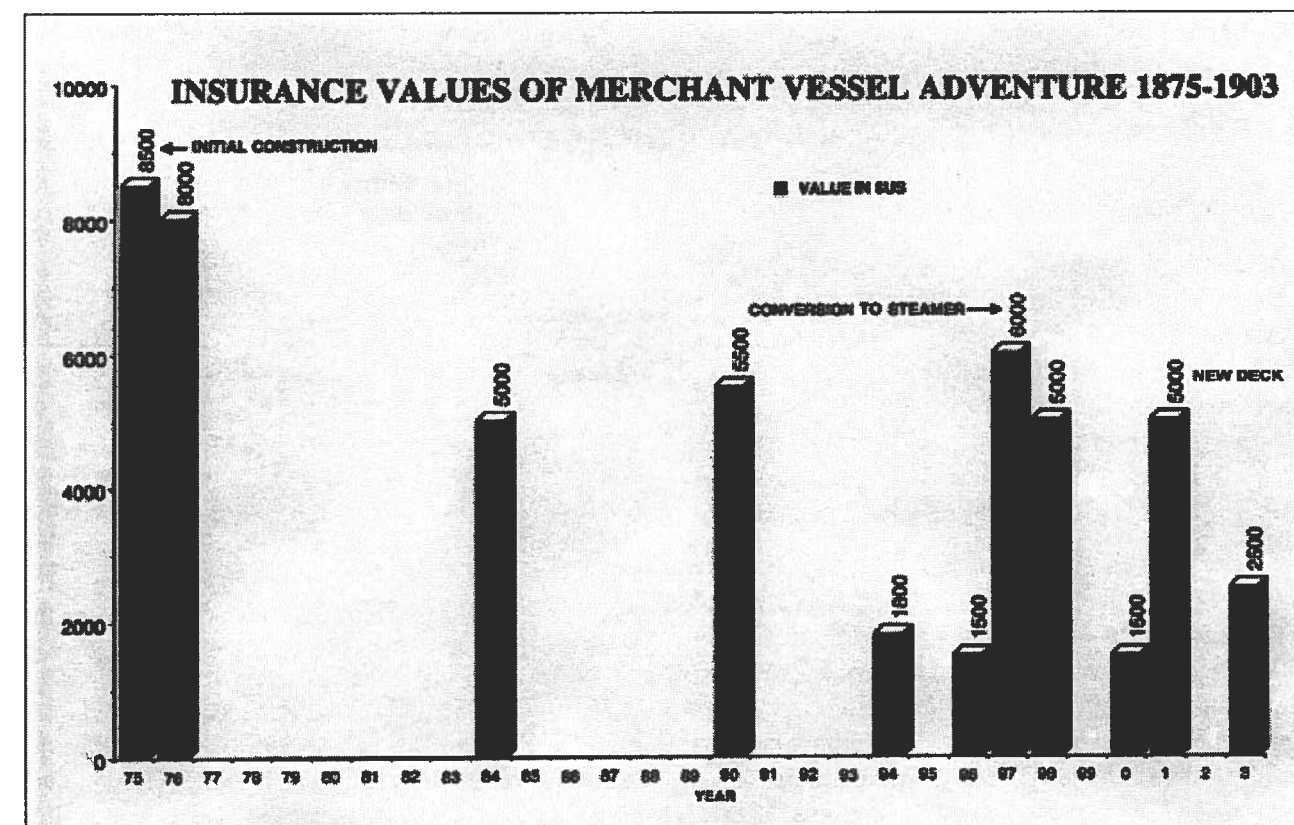


Figure 5. Insurance values of merchant vessel *ADVENTURE* 1875 to 1903.



In 1891, enrollment documents issued on February 13 show a change of district to Cleveland, Ohio, and a change in ownership to H. C. Case of Sheffield, Ohio (1/2) and J. F. Padley of the same place (1/2); Case is given as her master. On May 25, 1894, ownership interest was shifted to H. C. Case (1/4) and J. H. Padley (3/4), with Case remaining in command. April 11, 1895, documents show J. H. Padley (3/4) and J. M. Robinson of Lorain, Ohio (1/4) as owners and Robinson as her master. J. M. Robinson became sole owner of the schooner early in 1896 as reflected in an enrollment at Cleveland, Ohio dated February 4. Erroneously, the 1897 edition of *Inland Lloyds Vessel Register* continues to list Detroit as port of hail and the owners as Cunningham et al. The insurance value listed in this edition of *Lloyds* is only \$1,500 (Figure 5). At some time during the winter of 1896-1897, Robinson took in a partner. A new enrollment issued at Sandusky, Ohio on April 20, 1897 shows the vessel owned by Robinson (1/2) and Frederick Groch of Sandusky (1/2).

Temporary enrollment documents for April 20, 1897 [Sandusky] show master carpenter H. D. Root of Lorain as the rebuilders of the vessel in Sandusky. She was rebuilt as a screw steamer with one deck and two masts, plain head, and a round stern. The new dimensions were length 108 feet, breadth 24 feet, and depth 8.3 feet. The new tonnage was 141.72 gross and 95.37 net. Ownership is given as J. M. Robinson of Lorain (1/2) and Frederick Groch of Sandusky (1/2) with J. M. Robinson remaining as master.

Later that spring, permanent enrollment documents issued in Cleveland (May 26, 1897) list the owners as Frederick Groch of Sandusky (51/104), J. M. Robinson of Lorain, (51/104), and A. C. Moss of Sandusky (2/104). The home port is given as Lorain, and the master is listed as S. J. Putnam [or S. J. Batman]. During 1897, William H. McNalley, George Besh, and John M. Robinson also served as her masters.

The Groch Coal Company likely ran the *ADVENTURE* from Sandusky to Lorain and Cleveland in the stone, lime, and cement trade from 1897 until 1901 when she was sold to parties from Port Huron, Michigan. The 1897 edition of *Inland Lloyds Vessel Register* for side-wheel steamers and propellers lists her port of hail as Sandusky and the owner as Robinson et al. The 1897 edition of *Lloyds* lists a value of \$6,000, reflecting her conversion to a steamer (Figure 5). The 1898 edition of *Lloyds* shows a decrease to \$5,000 and

the 1900 edition reveals a marked, further decline to \$1,500. Enrollment documents for June 8, 1898 show Frederick Groch as sole owner and master.

Frederick Groch, listed as both owner and master, surrendered enrollment for the *ADVENTURE* in the Sandusky District on May 31, 1901 to new owners Charles Beyschlag (1/3), Joseph Lowes (1/3), and Jno. Beyschlag, Jr. (1/3), all of St. Clair, Michigan. They enrolled the vessel at Port Huron, Michigan, giving Charles Beyschlag as master. In 1901 a new deck was installed and she was refitted. Correspondingly, *Lloyds* upgraded the value of the vessel to \$5,000 (Figure 5). From 1901 until 1903 the *ADVENTURE* was engaged in the transport of lime and limestone from Kelleys Island and the delivery of salt to Sandusky, as well as handling cargoes of gypsum from Tawas Bay, Michigan on Lake Huron (Dorr and Eschman 1970:125,126). The 1902 edition of *Merchant Sailing Vessels of the United States* listed a crew size of four and the home port as Port Huron and the 1903 edition of *Beeson's List of American Steam Vessels on the Lakes* gives owner or manager as Charles Beyschlag of St. Clair, Michigan. The October 8, 1903 edition of the *Sandusky Daily Register* reported that the *ADVENTURE* had been in port at Sandusky "... a day or two ago and discharged a cargo of salt at the Big Four docks." On the same date the *Sandusky Evening Star* stated that the *ADVENTURE* was owned by "Charles Beyschlag of St. Clair, Michigan" while the *Port Huron Daily Times* and *Cleveland Plain Dealer* gave the owners as "Beyschlag, Schlinkert and Lowes of St. Clair."

On October 6, 1903, the *ADVENTURE* sailed from Sandusky to Kelleys Island, Ohio. During this voyage the *ADVENTURE* was commanded by Captain John Lowes who had his wife and young daughter on board. By 4:00 in the afternoon of October 7, she had taken on a cargo of burned lime at the Kelley Island Lime & Transport Company's North Bay dock when disaster struck. While lying at the dock she caught fire. The *Cleveland Plain Dealer* (October 8, 1903) noted that flames were first discovered just forward of the boiler in the hold and soon the ship was ablaze.

The *Sandusky Daily Register* (October 8, 1903) reported that the fire "... spread so rapidly that the sailors were glad to escape with their lives" and the *Sandusky Evening Star* (October 8, 1903) stated "It is reported that the lime became wet and was set afire, but this report is not confirmed." When it was seen

that the ship could not be saved, prompt action by Captain Regan of the steam tug *L. P. SMITH* in getting a line onto the burning steamer and towing her out into North Bay saved the schooner *ALEXANDERSON*, which was lying dangerously near the burning craft (Figure 6). The *ADVENTURE* was towed to shoal water near the base of the island's northeast point (Long Point) and allowed to burn itself out (Figures 7 and 8).

The *Sandusky Evening Star* reported that the captain and his family, as well as the crew, were rescued

but narrowly escaped death; most of their belongings were destroyed (October 8, 1903). The steamer and its cargo were a total loss as the vessel burned to the water line and sank in about 15 feet of water off Long Point in North Bay. The estimated value of the loss in 1903 was \$2,500 for the vessel and \$1,500 for the lime cargo (Figure 5). The *Sandusky Daily Register* (October 8, 1903) noted that the vessel and its cargo were uninsured.

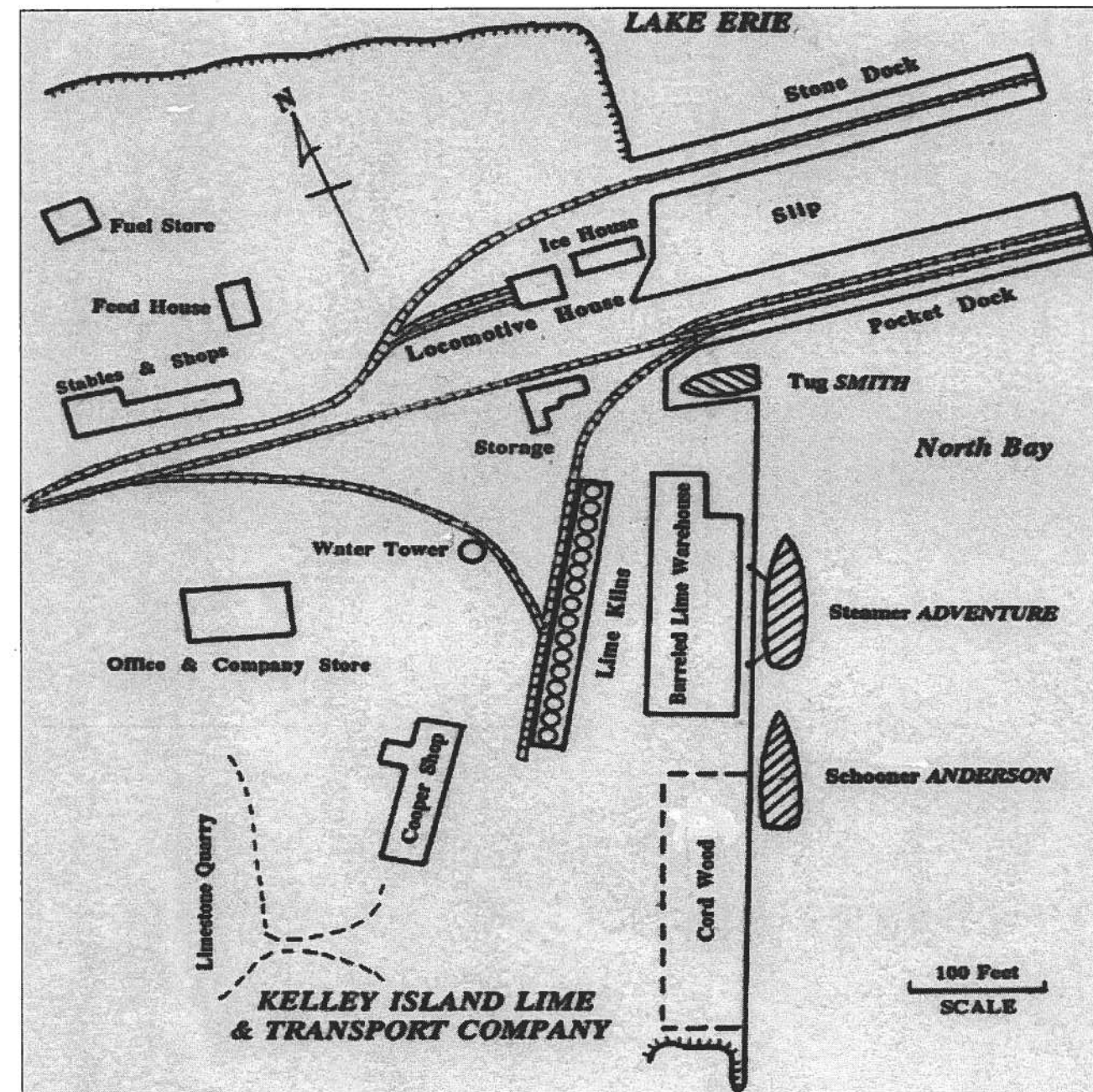


Figure 6. Map of Kelley Island Lime & Transport Company's North Bay quarry complex, circa 1903, showing probable locations of the steamer *ADVENTURE*, schooner *ALEXANDERSON*, and tug *L. P. SMITH* when the fire started onboard the *ADVENTURE* (based on 1893 and 1905 insurance maps and period photographs).

**KELLEYS ISLAND LIMESTONE INDUSTRY**

**GEOLOGIC SETTING**

Kelleys Island, a rocky outpost of less than 5 square miles, lays in western Lake Erie some 12 miles north of Sandusky, Ohio. The limestone quarries on Kelleys Island have long been known to science because of remarkable glacial grooves carved on the rock surfaces (Figure 9) and the well-preserved fossils of a Devonian coral reef (Bowe and Herdendorf 1990:1-8). For decades high-quality building stone, lime, and crushed rock were produced from these quarries (Stauffer 1909:136-142). Vessels like the *ADVENTURE* were essential in the transportation of these products to mainland markets.

shores (Fisher 1922:7). An uplift in the bedrock west of the Bass Islands, known as the Cincinnati Arch, gives the rock formations of western Lake Erie a regional dip toward the southeast. As a result, most of the islands of western Lake Erie, including Kelleys Island, have a cuesta or hogback shape with steep cliffs on the side toward the arch and gentle, shoaling coasts away from the arch (Figure 10). Long erosion of adjacent areas has left the resistant rock of Kelleys Island as a remnant of a limestone ridge that once divided preglacial river valleys. The Columbus Limestone is underlain by Lucas Dolomite, which is exposed in the bottom of the deepest quarries on Kelleys Island (Stauffer 1909:136-142).

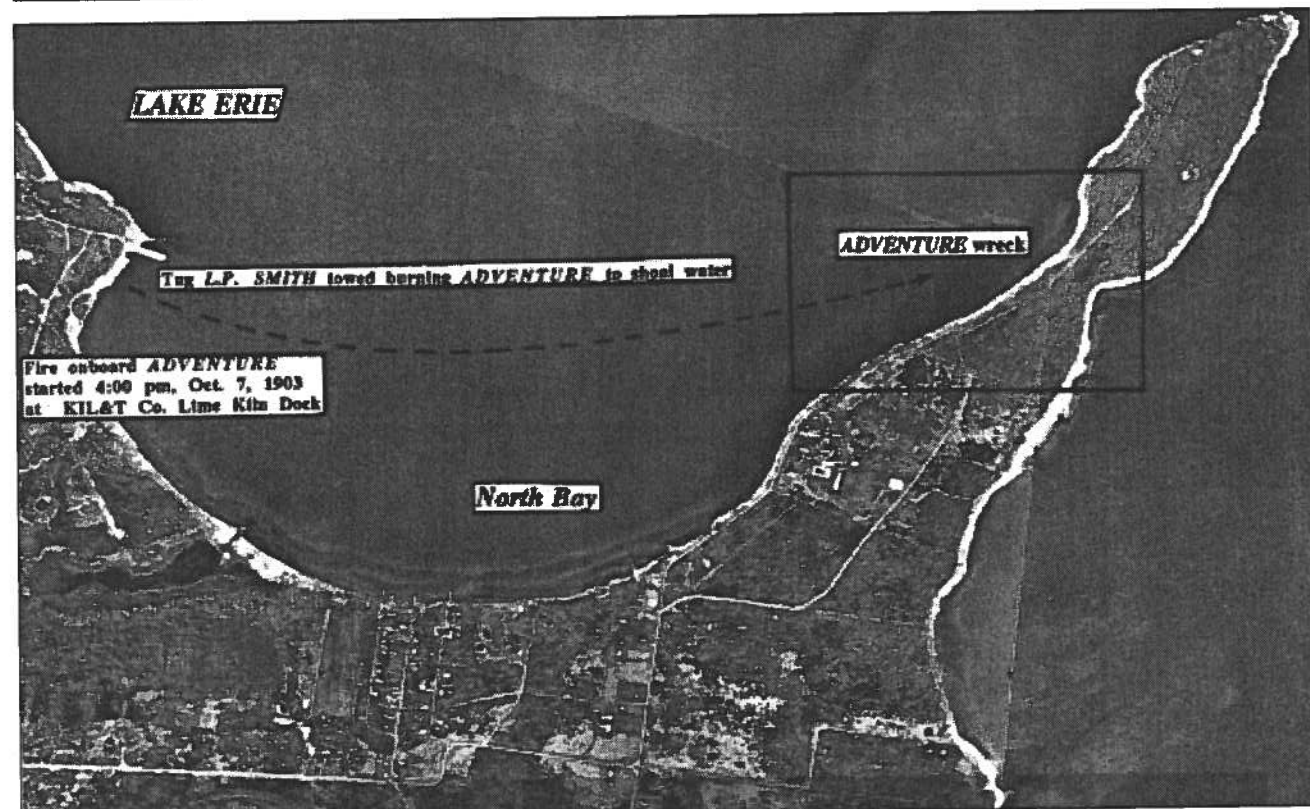


Figure 7. Aerial view of North Bay, Kelleys Island showing probable route of tug L. P. SMITH in towing the burning *ADVENTURE* away from her dock (1986 photo courtesy of Ohio Department of Natural Resources). See inset below.

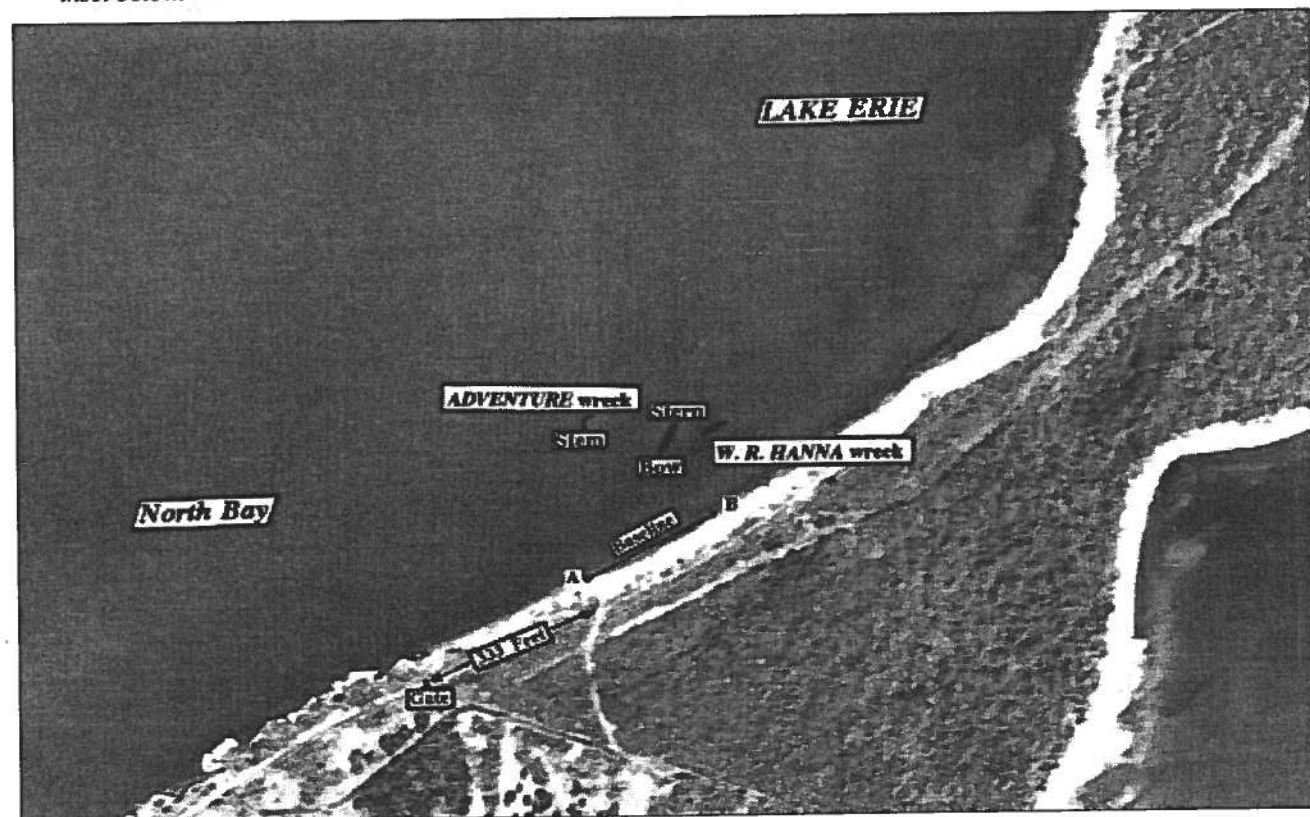


Figure 8. Aerial view of Long Point, North Bay of Kelleys Island showing location of steamer *ADVENTURE* as determined by 1997 field survey (1986 photo courtesy of Ohio Department of Natural Resources).



Figure 9. Glacial grooves in Columbus Limestone at G. W. Calkins & Company's North Bay quarry, circa 1873 (photo by A. C. Platt, courtesy of Ohio Historical Society). Note steamer *CHARLES HICKOX* at North Bay dock.

Columbus Limestone (Middle Devonian age) bedrock underlies the major portion of Kelleys Island. This formation is covered by only a thin layer of glacial drift, thus rock outcrops are common, particularly along the shores. Outcrops are of two types: (1) broad shelf areas with gentle dip slopes, common along the south and east shores and (2) vertical to overhanging cliffs up to 25 feet high, especially along the north and west

Columbus Limestone consists of three lithologic units on Kelleys Island: (1) a basal, thick-bedded, magnesium limestone layer, (2) a middle layer of cherty limestone, and (3) an upper sequence of thin-bedded highly calcareous limestone (Fisher 1922:9). The basal beds are well exposed in the North Bay and South Side quarries where they present a massive, vertical face of grayish-brown fossiliferous limestone, 22 feet thick



Figure 10. Geological cross-section through the islands of western Lake Erie, showing the bedrock formations (modified from Carman 1946:282).

(Figure 11). The cherty layer is about 4 feet thick in the quarry walls and contains numerous gray and white chert nodules. The upper unit is comprised of 25 feet of bluish-gray limestone and is the purest part of the formation. The bottom 8 feet of the upper unit is a massive layer of gray to brown limestone known to the quarrymen as "bottom rock" because it formed the

floor over most of the quarries, the next 7 feet up in this unit is more fossiliferous but somewhat less massive in character, while the top 10 feet of this unit splits into thin slabs (1 to 3 inches thick) on weathering (Figure 12) and contains extensive layers of brachiopod fossils, especially *Spirifer acuminatus*. (Fisher 1922:9, 21-23; Stauffer 1909:136-142).



Figure 11. Kelley Island Lime & Transport Company's North Bay quarry, circa 1900 showing use of steam drill to bore blasting holes (Capt. Frank E. Hamilton Albums, Charles E. Frohman Collection, Rutherford B. Hayes Presidential Center at Fremont, Ohio). Note Shay engine and cars (upper right) transporting quarry stone.

### QUARRY OPERATIONS AND LIME PRODUCTION

For seven decades, starting in the 1870s, quarrying was the leading industry on Kelleys Island. Earlier, around 1830, the first quarry was opened by John Clemons (Martin 1990:18). He and his brother exploited rock from the north shore of the island where limestone ledges rise 25 feet above the lake (Myers et al. 1992:22). The first shipments of limestone were made from a dock on North Bay (Ver Steeg and Yunck 1935:432). The potential for developing a limestone quarry industry on Kelleys Island was one of the factors which prompted Datus and Irad Kelley to purchase the island in the 1830s. The Kelley brothers continued to use the North Bay dock to ship stone, making their first shipments to Cleveland and other markets in 1834. They shifted their quarrying activities to the southern side of the island in 1835 and use of the North Bay quarry and dock were discontinued (Myers et al. 1992:22).

Quarrying activities resumed again on the north side of the island in 1872 when G. W. Calkins & Company of Cleveland, Ohio purchased 162 acres of quarry land from William D. Kelley and others to complement their smaller holding on the west side of the island. Until the purchase of the North Bay quarry, G. W. Calkins & Company shipped stone extracted from their West Bay quarry to Cleveland to be burned for lime (Myers et al. 1992:22). Soon after the land acquisition the company initiated an expansion which included a new dock, enhanced facilities for extracting and processing stone, and housing for quarry workers. In 1875 the company brought several lime kilns to the island from their Cleveland operation and erected them near the new North Bay dock. The same year an extensive cooper shop was built and an elevated wharf was added to the North Bay dock (Myers et al. 1992:23). At this time the company was owned by G. W. Calkins, M. C. Younglove, and Charles Hickox.

In December 1886, G. W. Calkins & Company was reincorporated as the Kelley Island Lime & Transport Company (KIL&T Co.) with M. C. Younglove, Caleb E. Gowen, and E. B. Merriam as partners. KIL&T Co. consolidated the holdings of the island's smaller operations into three "theaters" of operation: North Bay, West Bay, and South Side. KIL&T Co. became the largest employer and landowner on the island between 1886 and 1942, and eventually became the largest producer of lime in the

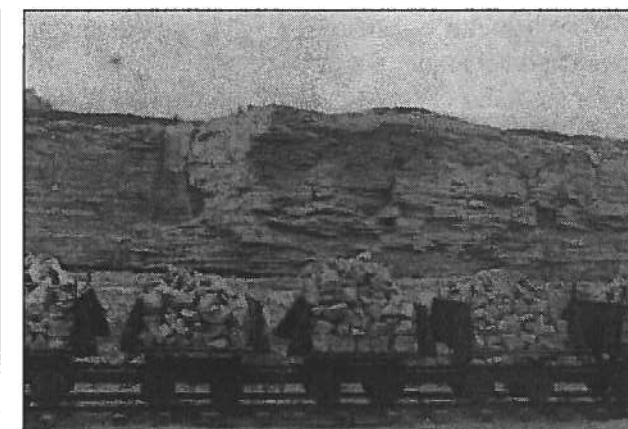


Figure 12. Thin bedded upper portion of the Columbus Limestone in South Side quarry, circa 1910 (photo by C. R. Stauffer, courtesy of Ohio Geological Survey). Note railway constructed on underlying "bottom rock"; stone destined for lime kiln or hopper dock.

world (Pape 1988:[8]11). In describing the island at the turn of the century, Thorndale (1898:215) noted that "... after a glance at the vast area of quarries and cored stone, and the outcropping ledges remaining, the island as a whole suggests itself as a single big lime rock, with a layer of earth spread over it." In 1918 KIL&T Co. reached peak production on Kelleys Island as 3,989,339 tons of stone were shipped on 316 boats (Myers et al. 1992:24).

When completed in the early 1900s, the North Bay complex (Ohio State Archaeological Site #33ER336) included an extensive quarry, 16 lime kilns (Figure 13), a cooper shop, warehouses for barrel storage, a stone crusher for production of flux stone, boarding houses and other facilities for the resident labor force, horse barns, carpenter and blacksmith shops, a locomotive shop, a water tower, and several other structures. A constantly changing network of roads and narrow gauge rail lines linked these facilities to the two docks on the North Bay of Kelleys Island (Figure 6).

Quarrying was easy and economical on Kelleys Island because the loose thin soil could be rapidly removed from above the limestone. Because the basal beds of the Columbus Limestone were best suited for dimension stone, deep quarries were the first to be developed. These quarries produced massive stone used for buildings, piers and breakwaters. In addition to building stone, the early quarries were soon organized to produce lime (calcium oxide). Lime replaced dimension stone as the main product in the

1870s with the construction of large kilns and dominated operations for three decades. By the early 1900s the focus changed from the production of lime to that of flux stone, an important ingredient in the manufacture of steel. To produce this type of stone, large stone crushing complexes were built on the island. With the decline in the demand for dimension stone, and the expense of deep quarrying for lime rock, the deeper parts of the quarries were abandoned. By the 1920s, only the thin-bedded upper zone was being utilized and that for crushed stone (Figure 12).

**Dimension Stone.** Kelleys Island dimension stone was sold by the cord, a cord being equivalent to 5.5 tons. Several docks were built and used for shipping both stone and cedar wood. Thus, numerous boats were able to dock at the island to purchase stone. A typical early cargo would amount to 50 or 60 cords of stone. The breakwaters at Cleveland and Cedar Point, Ohio were constructed with Kelleys Island limestone, as well as the piers for the Cleveland High Level Bridge. The first American lock at Saulte Ste. Marie, Michigan (1874-1876) was also built with Kelleys Island stone (Martin 1975:25). Ross (1949:39) points out that "... the islanders are proud of the fact that many churches

in Detroit, some of the finest office buildings in Cleveland, and the Poe lock at the Soo were built of stone taken from the island."

The early methods of quarrying on Kelleys Island were largely performed by hand. Until the 1880s the steps in the stone extraction process included drilling, black power blasting, and hand sledging. Blast-hole drilling was done with a single-jack (one man with a chisel and 4-pound hammer creating a 3-foot deep hole) or a double-jack (team of three laborers, one to hold drill and two to alternately strike it with 20-pound hammers). Hand-chum drills and hand augers that could reach a depth of 8 feet were also used. Dimension stone, stone for lime burning, and flux stone were all quarried with the same tools (Myers et al. 1992:27). The difference in their extraction was related to the size of the rock to be removed and this was controlled by the spacing and depth of the blast holes.

In the late 1880s the mode of quarrying was mechanized with the introduction of the steam drill. Once the holes were filled with powder a single set of blasts would free as much as 400 cords of blue-white stone, remarkably free of spots or impurities (Nichols

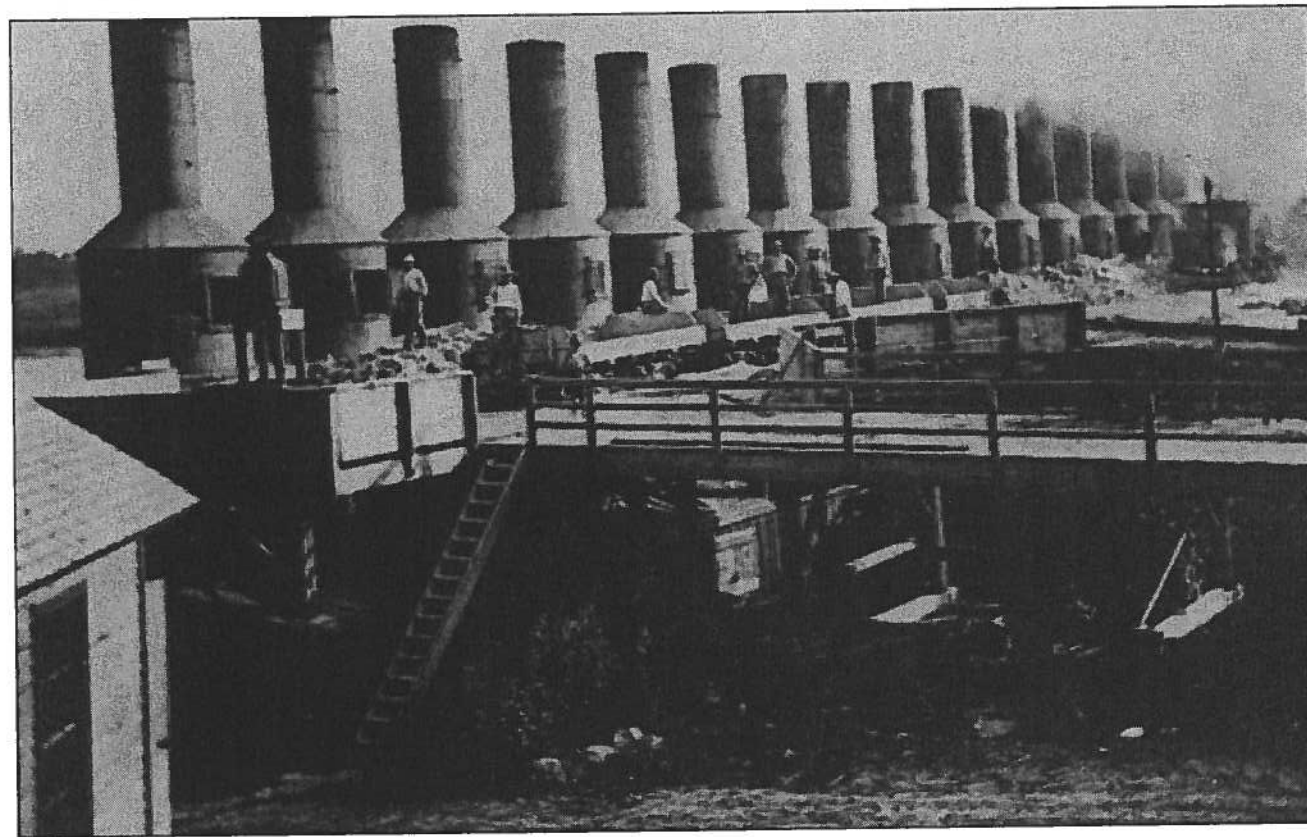


Figure 13. Kelley Island Lime & Transport Company's lime kilns at North Bay quarry complex, circa 1902 (courtesy of Ohio Historical Society). Note platform with limestone-filled cars from which the kilns were charged.

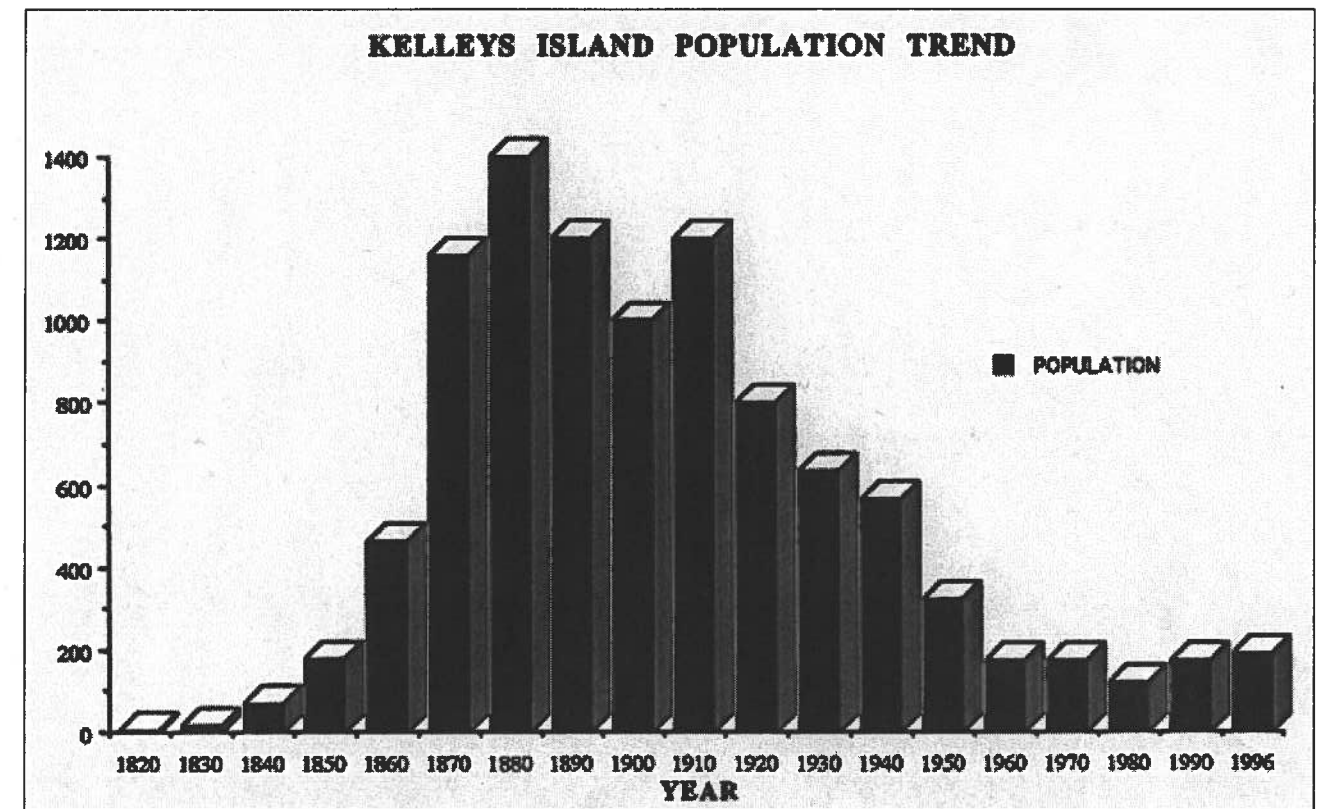


Figure 14. Kelleys Island, Ohio population trend 1820 to 1996 (data from U.S. Bureau of the Census).

1888:22). Steam drills at that time consisted of a piston drill that was an extension of the cylinder of a steam engine. These drills were powered by steam supplied by piping from a remote boiler (Myers et al. 1992:27). Piston drills were capable of drilling holes up to 15 feet deep.

**Lime Production.** As a secondary product of dimension stone quarrying, the broken blocks of the lower beds were burned for lime. These pieces had a higher magnesium content which required less heat to burn than the more calcareous upper beds (Fisher 1922:21). The north shore quarry (Ohio State Archaeological Site #33ER343) furnished both the magnesium-rich portion of the Columbus Limestone and underlying beds of Lucas Dolomite, also rich in magnesium, for the lime kilns.

The first lime kilns on Kelleys Island were built on the south shore by George Kelley in 1855 (Pape 1988:[8] 12; Myers et al. 1992:30). and by G. W. Calkins & Company on the north shore in 1875 (Behnke 1974:7). In 1886 a huge complex of lime kilns was positioned at North Bay by the KIL&T Co. when the demand for building stone declined. Nichols (1888:23, 24) describes the early operations of the KIL&T Co. in vivid detail. Within two years, KIL&T

Co. laid five miles of railroad track on the island and operated two locomotives and 15 cars to haul the stone to the kilns and to the docks for shipment to commercial centers. At the quarries KIL&T Co. employed a stationary engine and two diamond drills while at North Bay it built 16 state-of-the-art iron kilns to burn the limestone. KIL&T Co. also constructed residences for its employees and established a general merchandise store because the center of Kelleys Island village was 1.5 miles distant. In all, KIL&T Co. invested about \$300,000 during its first two years of operation.

By 1907, KIL&T Co. holdings covered over 1,000 acres, they had invested over \$8,000,000, and advertised their company as the "largest of its kind in the world" (Hatcher 1949:304). To work the quarries and kilns, KIL&T Co. imported foreign workers from central and eastern Europe—Italians, Slavs, Greeks, Hungarians, Portuguese, Poles, Macedonians, Bulgarians, and Germans. A large group of them lived on Kelleys Island, others in the vicinity of Marblehead. The population of Kelleys Island from the mid-1800s to the mid-1900s fluctuated largely in response to quarrying operations on the island, with the peak island population of nearly 1,200 corresponding to the peak period of limestone production—from about 1870 to

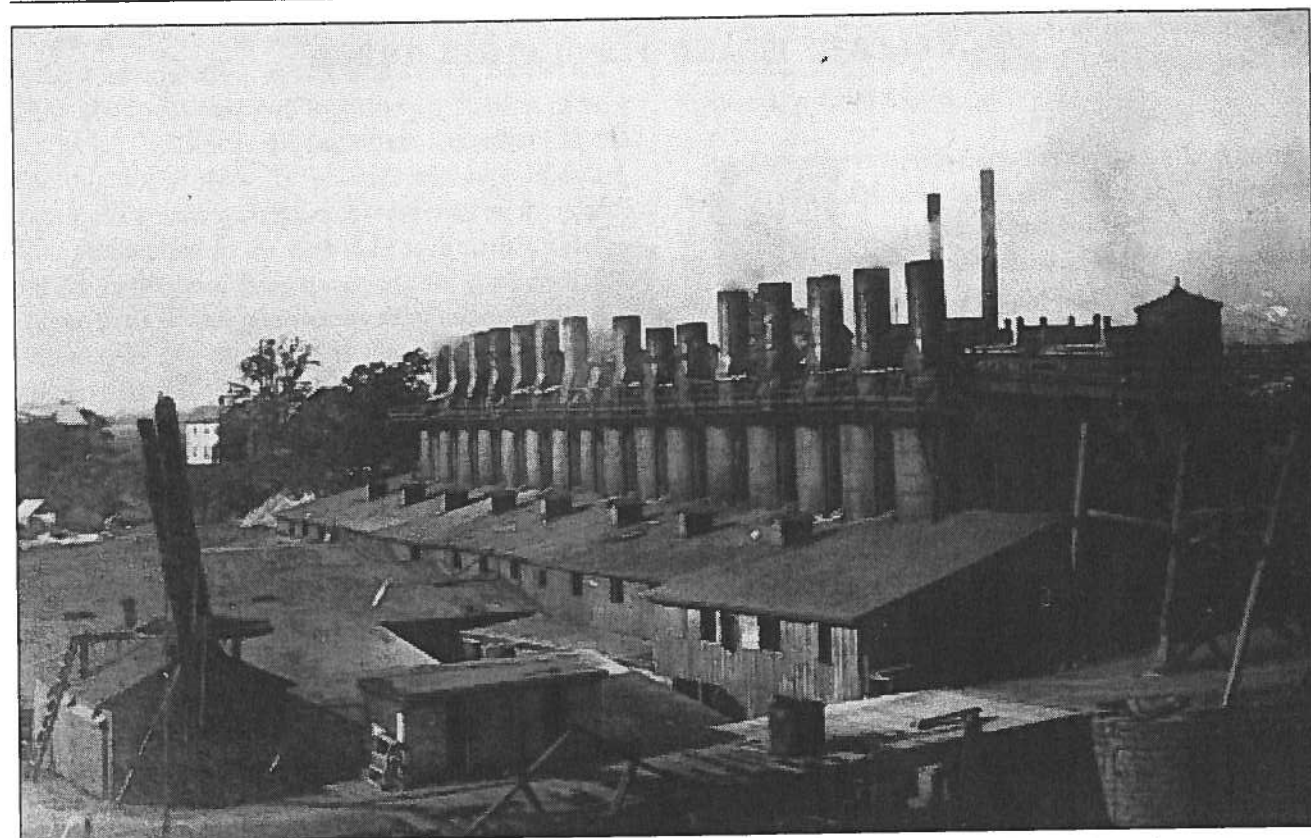


Figure 15. Kelley Island Lime & Transport Company's lime kilns at North Bay quarry complex, circa 1900 (Capt. Frank E. Hamilton Albums, Charles E. Frohman Collection, Rutherford B. Hayes Presidential Center at Fremont, Ohio). Note sheds at base of kilns to protect the lime and bridge to dock (center foreground).

1920 (Figure 14). At the turn of the century over half of the occupations on Kelleys Island were directly related to the limestone industry (Myers et al. 1992:35). In the late 1930s, the workings on the island began to dwindle along with the population. Thereafter, KIL&T Co. concentrated its operations on Marblehead Peninsula.

The North Bay kilns were so constructed that the stone was conveyed by car or wagon to the mouths of the kilns which were constructed on the same level as the quarry floors (Figure 13). The kilns burned about 80 cords of stone and 48 cords of wood per day. Once the supply of wood on the island was used up other sources were developed. Nichols (1888:24) noted that "... an inexhaustible supply [of wood] being obtained from the Canadian shore, just across the lake." Wood for the kilns was also obtained from Oak Harbor on the Portage River in Ottawa County, Ohio.

After burning to drive off carbon dioxide, the lime (calcium oxide) was drawn out at the base of the kiln onto a substantial stone floor where it was packed into wooden barrels (Figure 15). The barrels were then

rolled to an adjacent warehouse (which had a 6,000-barrel capacity) or on shipboard as vessels layed along side the warehouse dock. The kiln-dock complex included a large cooper shop where 22 men were employed in making and repairing barrels (Figure 16). The annual lime production by KIL&T Co. in the late 1880s was about 650,000 barrels and involved some 275 workers. Nichols (1888:23) observed that "... the lime produced by this firm is singularly white, strong and pure, being used almost exclusively for building and plastering purposes."

When limestone, a carbonate of calcium ( $\text{CaCO}_3$ ), is heated sufficiently it undergoes a decomposition which yields calcium oxide and carbon dioxide ( $\text{CaCO}_3 = \text{CaO} + \text{CO}_2$ ). The temperature required to maintain this conversion at one atmosphere of pressure is about 1,250° F (Nebergall et al. 1963:650). The manufacture of calcium oxide or "quicklime" on Kelleys Island was carried out in tall chimney-like furnaces known as kilns. In a continuous process, the limestone, which was fed in at the top of the kiln, was heated and decomposed by a draft of hot gas, and the lime was drawn off at the bottom of the

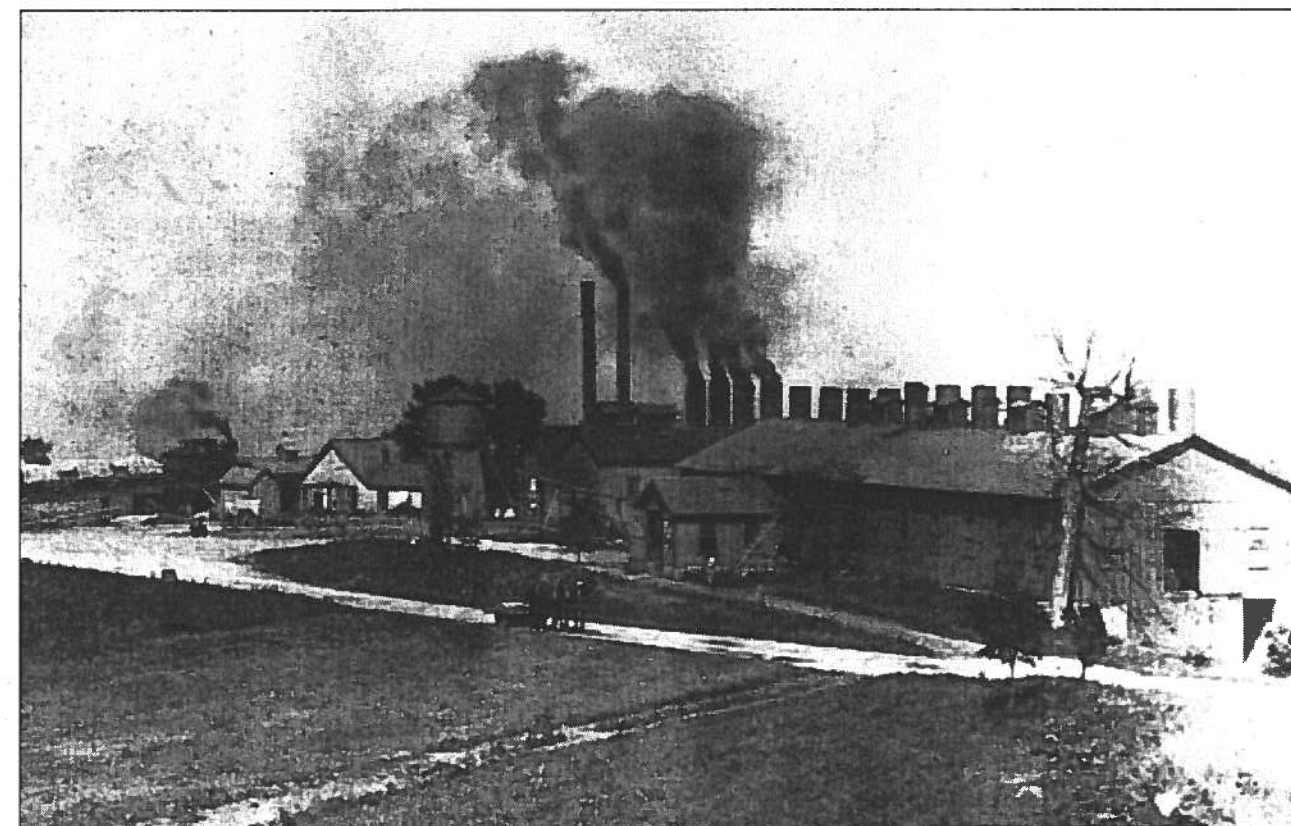


Figure 16. Kelley Island Lime & Transport Company's cooper shop (right) and kilns at North Bay quarry complex, circa 1900 (Capt. Frank E. Hamilton Albums, Charles E. Frohman Collection, Rutherford B. Hayes Presidential Center).

kiln (Figure 17). The blast of hot gases through the furnace kept the partial pressure of the carbon dioxide at a minimum and permitted the reaction to go to completion at a much lower temperature than would otherwise have been required (Nebergall et al. 1963:650). In the furnace, carbon dioxide began to disassociate at 700° F and was completely freed at 900° F. Operators attempted to maintain a constant temperature of 800° F in the kilns for optimal processing (Myers et al. 1992:30). Wood was typically used to fuel the Kelleys Island kilns.

Pure calcium oxide is a white amorphous substance that emits an intense light, called "limelight" when heated to a high temperature. Lime reacts vigorously with water and exothermally (releasing heat), forming a hydroxide ( $\text{CaO} + \text{H}_2\text{O} = \text{Ca(OH)}_2 + 15,500$  calories) which is known as hydrated lime or slaked lime (Nebergall et al. 1963:651). Because lime is a perishable product, particularly susceptible to the deleterious effects of moisture, the most convenient and safe way to ship the product from Kelleys Island was in watertight barrels.

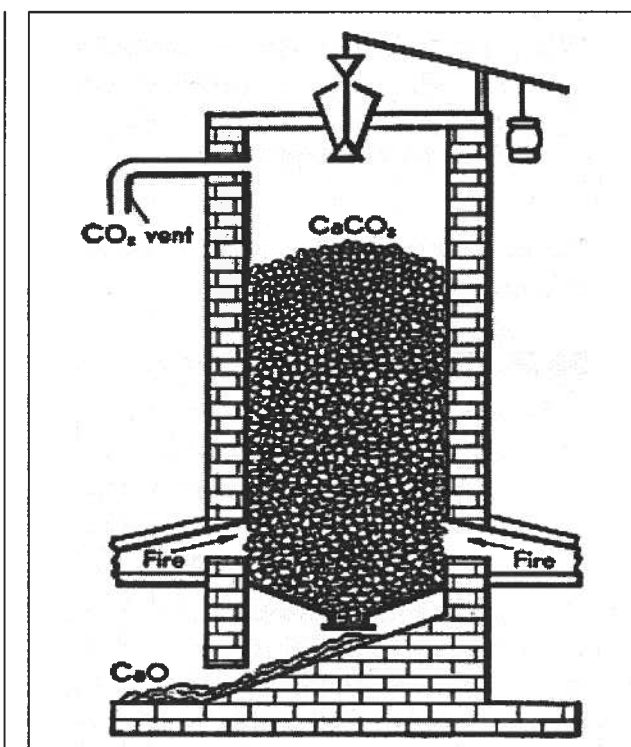


Figure 17. Typical cross-section of a lime kiln (from Nebergall et al. 1963:651). Once fired, kilns were operated for weeks without shutting down.

At the turn of the century, the 16 North Bay kilns were running at full capacity, producing 1,800 barrels of lime per day plus large volumes of crushed stone. KIL&T Co. then employed about 500 men and 50 horses. However, by the second decade of the century, the company found it cheaper and more convenient to ship the stone, and then burn the lime at its plants in Duluth, Minnesota. Thus, on Kelleys Island the focus of its operation changed from the production of lime to the production of flux stone and the kilns and coopeage on North Bay were torn down (Ryall 1913:188).

**Crushed Stone.** The introduction of the Bessemer converter to the steelmaking process began to affect the limestone industry by 1870. In this process, flux stone is added to molten iron to draw-off impurities, thus creating a new demand for crushed stone from the Kelleys Island quarries. To produce flux and other types of crushed stone, two large stone crushing complexes were built, one at North Bay and one at South Bay. Crusher plants, storage bins, and railroad grades are still extant at these two sites. The large scale production of flux stone also required a sizable inventory of narrow gauge rolling stock and steam cranes. A machine shop, blacksmith shop, locomotive shed, and ancillary sheds were established at West Bay to accommodate maintenance and repair

of these components and an office building/general store were built at the North Bay quarry (Figure 18).

Flux stone requires a fairly high content of calcium carbonate and a correspondingly low amount of silica and alumina, while a higher content of magnesium carbonate can be tolerated for stone burnt for lime (Fisher 1922:21). The following analyses were performed by the Ohio Geological Survey (Lord 1884:534; Orton 1888:753) in the 1880s on Kelleys Island stone destined for these two purposes:

Component	Flux stone for iron smelting	Stone to be burnt for lime
silica	1.81%	1.65%
alumina and iron	0.75%	0.14%
calcium carbonate	87.50%	77.22%
magnesium carbonate	9.75%	20.19%
residue	0.19%	0.80%

In referring to the thinly bedded rock overlying the lime beds, Nichols (1888:23) also pointed out that "... above the famous limestone being a valuable and extensive strata of what is termed 'flux stone' used in the process of purifying metals, which commands a ready market all over the continent." This upper part of the Columbus Limestone is a very pure limestone and therefore was valuable for use as lime and flux. Analyses indicated increasing proportions of magnesium carbonate ( $MgCO_3$ ) and decreasing

portions of calcium carbonate ( $CaCO_3$ ) from the top to the bottom. In the upper beds the amount of  $CaCO_3$  was as high as 97% and the amount of  $MgCO_3$  was as low as 27%, whereas the lower massive beds ran as low as 78%  $CaCO_3$  and as high as 20%  $MgCO_3$ . Alumina, iron oxide, and silica made up the remainder (Ver Steeg and Yunck 1935:431). The lower massive beds best served dimension and building stone needs.

In the early 1920s, the upper part of the Columbus Limestone was quarried by drilling a row of holes 25 feet back from the working surface, 25 feet apart, and 15 feet deep. Charges of dynamite were set in these holes and the entire mass was "shot down" (Fisher 1922:22). The stone was loaded by steam shovels into dump cars and hauled to crushers where it was broken and graded according to size. At that time crushed limestone had three primary uses: (1) flux, (2) road ballast and metal, and (3) the main constituent of concrete. As flux, the stone was used in smelting iron and copper, and in the manufacture of bottle and window glass. Flux stone had to pass through a 4-inch ring, but be retained on a 2-inch ring; ballast stone had to pass through a 2-inch ring, but be retained on a 0.75-inch ring; concrete stone had to pass through a 1.25-

inch ring; and for surfacing roads, all that passed through a 0.75-inch ring, including dust, was used (Fisher 1922:21).

The rapid falling off in demand for building stone in the late 1800s and the increase in demand on crushed stone for lime, flux, and road building made it more economical to quarry only the thin bedded upper rock and just some of the "bottom rock" of the Columbus Limestone. Ver Steeg and Yunck (1935:432) noted that "... as a result almost the whole top of the island is being removed from west to east; the average depth of the vast quarry is twenty-five feet."

Because the upper thin-bedded stone was generally less than 20 feet thick, the later quarries tended to expand over great areas without attaining much depth. By the early 1920s KIL&T Co. owned about 40% of the island and most of its holdings had been opened to quarries of the upper strata (Figure 19). The islanders began to resist any attempts on the part of KIL&T Co. to obtain more land, fearing that practically the whole island would be devastated by extension of the quarries (Fisher 1922:23). Thus, quarry operations began to dwindle and KIL&T Co. went out of business on the island in the 1940s (Figure 20).



Figure 18. Kelley Island Lime & Transport Company's office building and company store at North Bay quarry, circa 1903 (Capt. Frank E. Hamilton Albums, Charles E. Frohman Collection, Rutherford B. Hayes Presidential Center at Fremont, Ohio). Note steam crane (whirly) on track at quarry's edge and crushed stone on quarry floor.

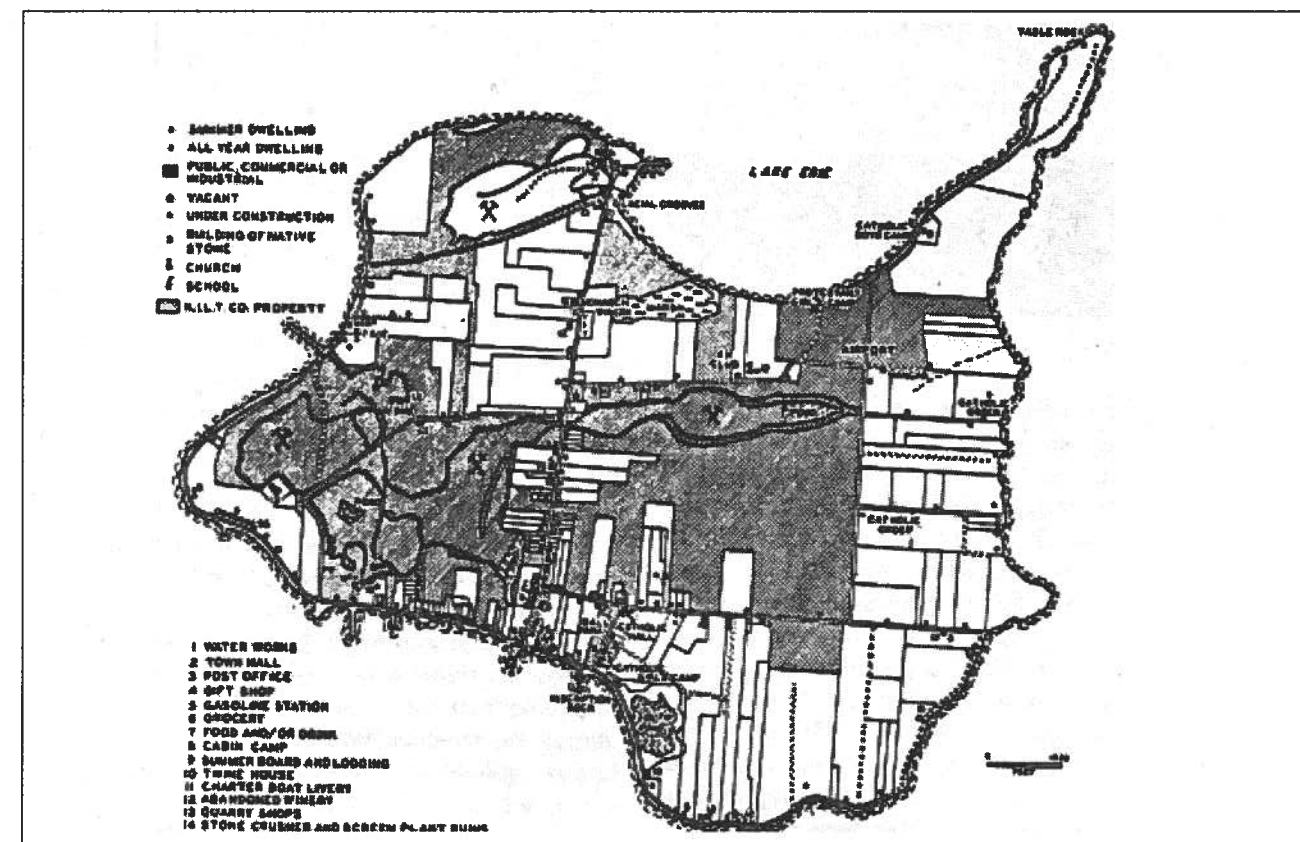


Figure 19. Map of Kelleys Island showing property ownership in 1947 (from Morrison 1950:111). Note large percentage of the island owned by Kelley Island Lime & Transport Company.



Figure 20. Aerial view of abandoned North quarry showing excavated glacial grooves at left center, circa 1971 (photo by Tom Root, courtesy of Ohio Historical Society).

### MARITIME TRANSPORTATION

The transport of limestone and lime products contributed greatly to the early commercial traffic on the Great Lakes and has traditionally ranked among the top five commodities in shipping tonnage. Because of its offshore location, limestone operations on Kelleys Island were totally dependent on maritime transportation to carry products to mainland markets. Initially, much stone, well adapted to building purposes was shipped from Kelleys Island, but in the later years all the limestone was crushed and shipped to Lorain, Cleveland, Buffalo, and Gary for flux, or to Duluth to be burned into lime. When the KIL&T Co. was formed in 1886, one of the company's first requirements in developing the vast deposits of limestone on Kelleys Island was the establishment of terminals for mainland distribution. These were created in Buffalo, Cleveland, Detroit, and Duluth (Nichols 1888:23). In the late 1800s the quarry operators burned lime on the island and shipped it throughout the Great Lakes region until it was found to be more economical to burn stone near the markets or near sources of fuel (Ver Steeg and Yunck 1935:433).

In 1875 the Kelleys Island and Sandusky Cable Company successfully layed a submarine cable on the bed of Lake Erie between the island and the mainland. The cable was attached to an instrument in the Atlantic and Pacific Telegraph office in Sandusky and on July 8 the first message was sent from Erastus Huntington on the island to George Daniels, mayor of Sandusky (Peeke 1916:341). This communication link greatly facilitated orders for limestone products and dispatching vessels to distant markets.

During the decade before and following the turn of the century, North Bay lime kilns produced up to 1,780 barrels of lime per day (Figures 21 and 22). The peak of the limestone business on Kelleys Island occurred during this period when mechanization stepped up production, creating a boom. KIL&T Co. grew to be the largest limestone producer in the country and its stone was reputed to be the best (Gilfillan 1959:20). With the construction of the West Bay loading dock in 1910 (Figure 23), KIL&T Co. was able to increase its production of stone. For the next decade the company shipped over half a million tons annually in some 600 lake carriers (Linhardt 1995:35). The company continued to expand and eventually the opening of new quarries on the mainland led to the abandonment of those on Kelleys Island in the 1940s.

**Dock Facilities.** In the 1880s quarried stone was sorted into 8 to 10 grades and then conveyed to waiting vessels or corded on the docks. The stone was loaded onto vessels by horse-drawn wagons from an elevated platform, through aprons or chutes lying on either side. The docks had sufficient facilities for expeditiously loading a number of vessels at a time. Nichols (1888:22), writing of the scene at the South Side dock, reported that "... vast walls [of stone] may be seen from passing steamers" and "... no rubbish or loose stone is allowed to accumulate, and everything about the dock has a neat and orderly appearance seldom met with." At that time market for the limestone extended from the lower end of Lake Erie to Duluth.

At the North Bay quarry, burned lime was the dominant product in the 1880s. The lime was packed into wooden barrels for storage in an adjacent warehouse or loaded directly on waiting vessels. Maritime facilities also included a concrete pocket dock which consisted of an extended jetty with an elevated track and chutes for loading boats. Barges, steamers, and other vessels of 8,000- to 10,000-ton capacity could be easily loaded from this dock in a matter of two to three hours (Ryall 1913:186).

By 1898, KIL&T Co. operated several Shay locomotives (built by Lima [Ohio] Locomotive Works) and 150 cars in the quarries. Four steam shovels were used in connection with the crushing plant and 8 large derricks were employed in loading the large sections of stone blasted from the limestone beds. Four docks, lying on the north, west, and south shores, were owned by KIL&T Co. and afforded ample facilities for loading vessels with stone. A railway system connected all of the quarries to the docks; light engines, drawing 10 to 12 cars, were used to transport the stone. In describing the scene, Ryall (1913:186) commented that "In noise, and importance, these little engines resemble the small but mighty harbor tug. They draw heavy loads and are very busy."

Flux stone had become the major focus the island's limestone industry by the first decade of the 20<sup>th</sup> century. The increased production of flux stone necessitated the construction of improved dock and loading facilities. Because crushed stone was sold by weight, in 1907 a scale house was constructed along the rail grade connecting the stone crusher with the North Bay dock. This facility permitted large volumes of flux stone to be weighed in an expeditious manner (Myers et al. 1992:31).

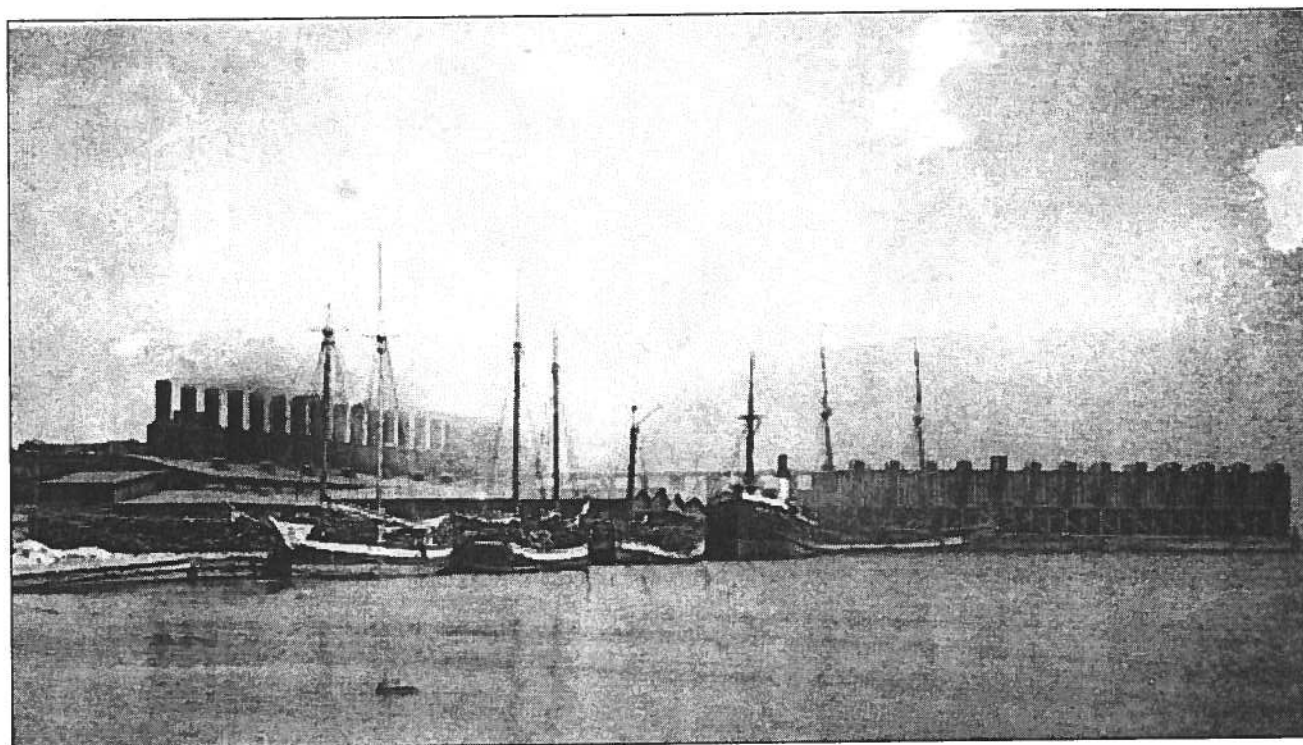


Figure 21. Kelley Island Lime & Transport Company's dock and kilns at North Bay quarry complex, circa 1900 (photo by Rev. Harry Cooke, courtesy of Great Lakes Historical Society). Note scow schooners loaded with cord wood for fueling kilns.

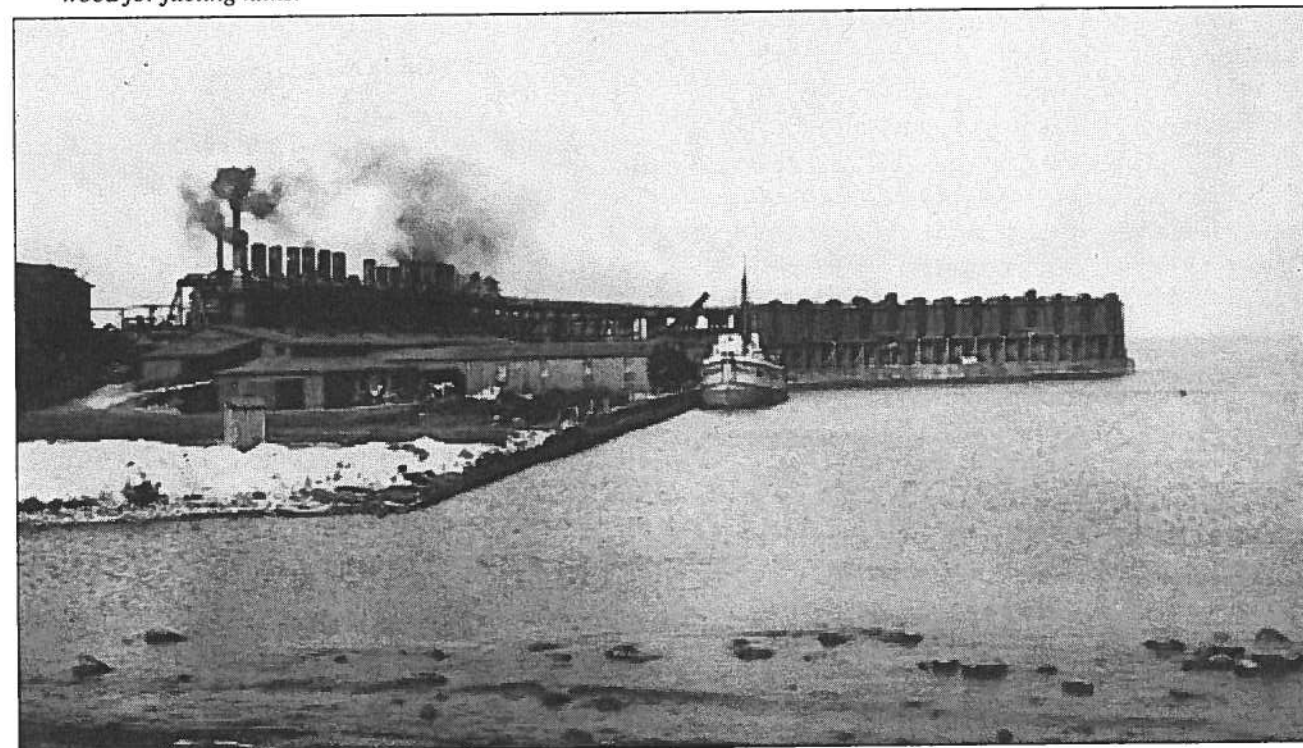


Figure 22. Kelley Island Lime & Transport Company's dock and kilns at North Bay quarry complex, circa 1910 (Capt. Frank E. Hamilton Albums, Charles E. Frohman Collection, Rutherford B. Hayes Presidential Center at Fremont, Ohio). Note steam barge ALBERT Y. GOWEN at lime kiln dock.



Figure 23. Kelley Island Lime & Transport Company's West Bay dock, circa 1925 (Capt. Frank E. Hamilton Albums, Charles E. Frohman Collection, Rutherford B. Hayes Presidential Center at Fremont, Ohio). Note Shay steam locomotives pushing narrow gauge dumping cars, loaded with crushed limestone, via a 600-foot-long overhead trestle to storage bins at the end of the dock. From the bins stone was loaded directly by gravity into bulk freighters.

The stone loading docks on the north and south shores were less used after 1910 when a central facility was constructed on the west shore. Built on the same pier site as the first Titus quarry dock of 1842, West Bay dock was designed to accommodate narrow gauge dumping cars via a 600-foot-long overhead trestle (Myers et al. 1992:24). In the 1920s, stone was loaded by steam shovels into dump cars and hauled to crushers where it was broken and graded according to size. It was then reloaded into dump cars for transport to great storage bins (Figure 23). From the bins the stone was loaded directly by gravity into bulk freight boats. At the South Side dock the stone was loaded directly from the cars into boats (Fisher 1922:22). By the 1930s, the north and south loading docks were abandoned and all stone was dumped into freighters and barges from an elevated pier on the west shore.

**Merchant Vessels.** One of the earliest steam vessels associated with the limestone industry, *ISLAND QUEEN*, was built on Kelleys Island in 1854. She was a 169-ton wooden sidewheel steamer with an overall length of 121.5 feet, beam of 20.6 feet, and draft of 7 feet (Frohman 1965:77). This vessel was owned by a stock company formed by Addison Kelley to meet the

transportation needs of the Ottawa City Cement Company on Catawba Island. Investors on Kelleys Island contributed \$7,000 and José DeRivera St. Jurgo of Put-in-Bay \$2,000 toward the original stock subscription. When completed the total cost was about \$18,000, twice the amount estimated and subscribed, and she "...did not pay out for five years" (Hills 1925:134,135).

The cement works at Ottawa City, located about five miles west of Kelleys Island at the northern extremity of Catawba Island, was then in full operation and shipping cement to various lake ports. The management of the company made liberal offers, in the way of freight guarantees, as an inducement to build the *ISLAND QUEEN*. The keel was laid in July on George Kelley's shore dock and she was launched in late November. After being frozen in for over a month at the island, on January 7, 1855 she was towed to Sandusky by the steamer *ARIEL* where her machinery was installed. She was powered by an upright or "Sawgate" high-pressure engine. She was ready for service in the Spring of 1855. Her route included Fremont, Plaster Bed, and other Sandusky Bay ports, besides Sandusky, Ottawa City, and the Lake Erie



islands. She also went once a week to Cleveland and Toledo with cement from Ottawa City and made part of her earnings by towing sailing vessels in and out of Sandusky Bay (Hills 1925:134). She was commanded by Captain George W. Orr (Peeke 1916:340).

When the Civil War broke out the economy of the region improved and the *ISLAND QUEEN* made money. She gave up going to Fremont and began daily, instead of tri-weekly, trips to the islands except when she carried freight to Huron, Black River, or some other port along the Ohio shore after completing her excursions. Only two vessels were owned by Kelleys Islanders in 1863, the *ISLAND QUEEN* valued at \$5,000 and a sailboat at \$150. Seven men were employed as crew for these vessels out of a total island population 600 for that year. Peeke (1916:340) reported the coastwise exports from Kelleys Island for 1863 as follows:

Red cedar (714 cords)	\$ 4,291
Limestone (390 cords)	780
Steamboat wood (3,248 cords)	4,102
Corn, wheat, and pork	<u>2,000</u>
	\$11,173

The *ISLAND QUEEN* never met with a serious accident or suffered anything more than a broken crank

shaft until she was captured by the Confederate "Rebels" in September 1864, in an ill-fated attempt to free Confederate officers from the Federal prison on Johnson Island, and sunk on Chickenolee Reef about eight miles north of Kelleys Island (Frohman 1965:77-81). She was raised in a few days, comparatively uninjured and put back in service, but sold two years later because the growing business on the route necessitated a larger boat. She was replaced by the 340-ton steamer *EVENING STAR* (Hills 1925:134; Peeke 1916:40).

Another class of vessels frequenting Kelleys Island loading docks after the middle 1860s was the "steam barge." This was a single-decked, wooden steamer of a little more than 100 feet in length, built to carry lumber cargoes or bulk products such as salt, stone, coal, or iron ore. The earliest steam barges had their pilothouses and all of their cabins perched on the stern along with boiler and engine spaces. After 1880 larger steam barges appeared, some as much as 200 feet in length with raised forecastles and pilothouses at the bow. Most of the steam barges in the Kelleys Island stone trade were of the smaller variety, seldom exceeding 120 feet in length (Figure 24).

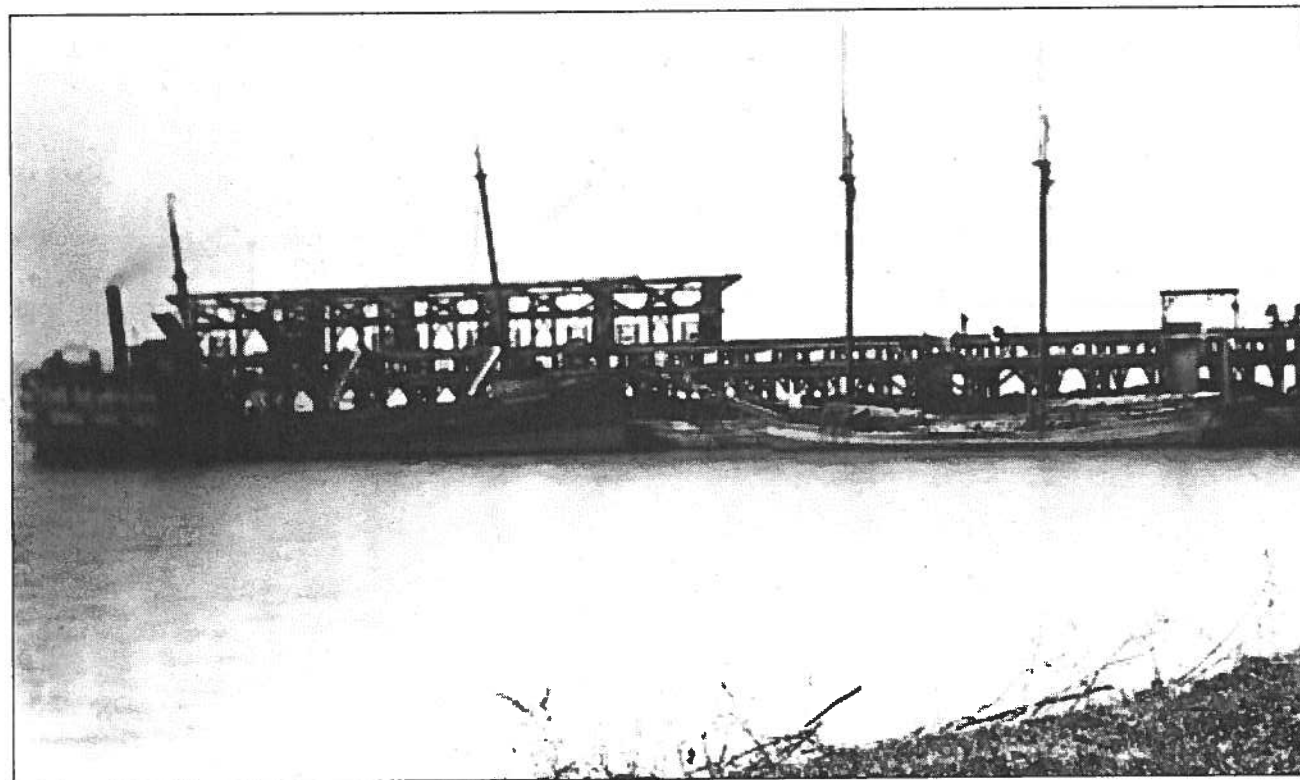


Figure 24. Steam barge *CHARLES H. DAVIS* and scow schooner *FX* at the South Side dock, Kelleys Island (Capt. Frank E. Hamilton Albums, Charles E. Frohman Collection, Rutherford B. Hayes Presidential Center at Fremont, Ohio).

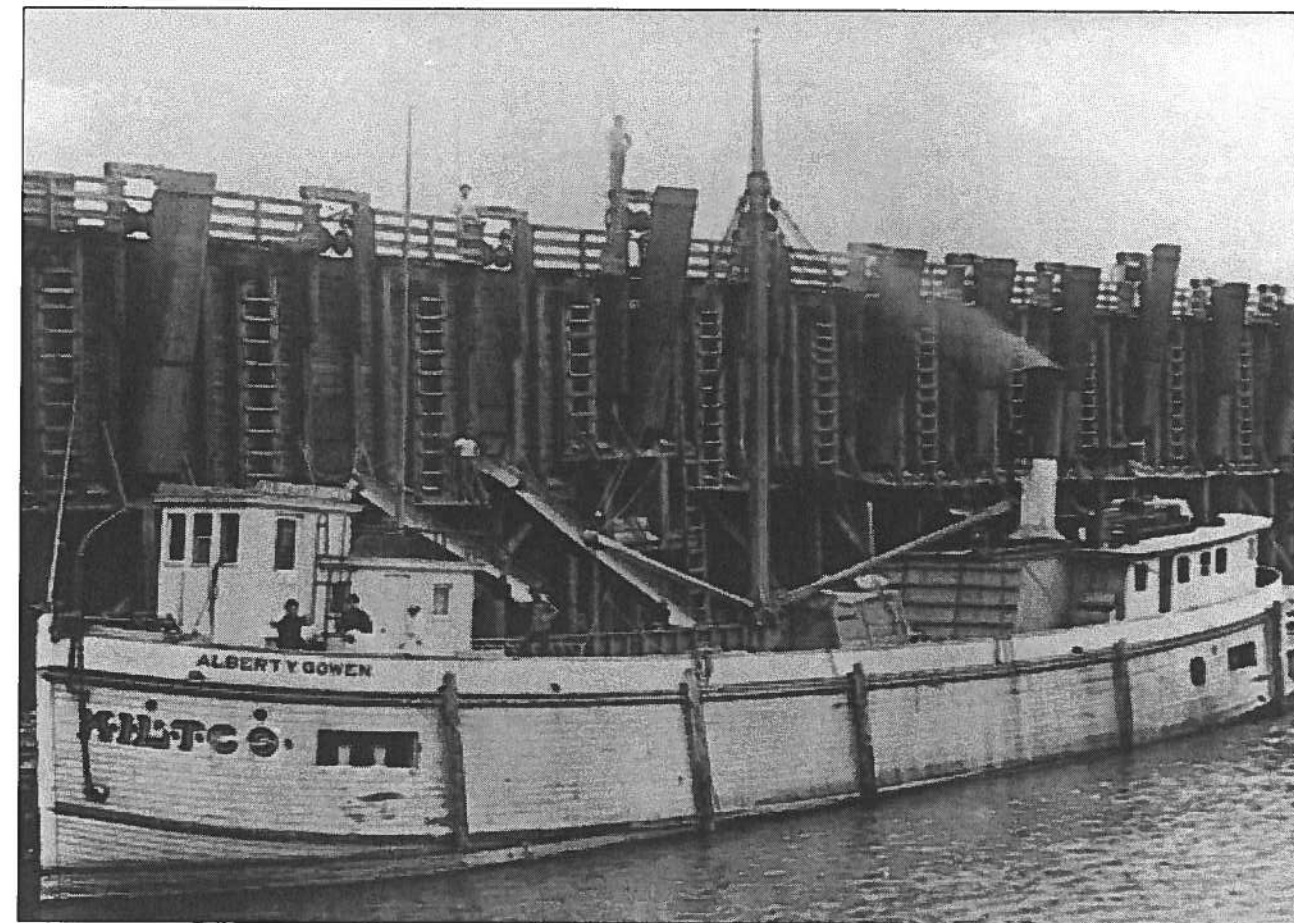


Figure 25. Kelley Island Lime & Transport Company's steamer *ALBERT Y. GOWEN* at North Bay dock, Kelleys Island, circa 1890 (Historical Collections of the Great Lakes, Bowling Green State University). Vessel was built by Henry D. Root for KIL&T Co. in 1888 at Lorain, Ohio and measured 124 x 26 feet, 359 gross tons. Unlike the *ADVENTURE*, the *GOWEN* was a double-decked, bulk freighter.

About 1860 the scow *ELMINA* was lost in a fog while engaged in carrying stone from Kelleys Island to Cleveland for her owner, Charles Carpenter (Hills 1925:135). In 1872 the steam barge *CHARLES HICKOX* (Figure 9) was built for G. W. Calkins & Company (owner of North Bay quarry) by Henry D. Root at Lorain, Ohio to carry lime and limestone from Kelleys Island to Cleveland. In 1878 Norman Kelley bought the screw steamer *MONITOR* and the schooner *ONEIDA* for the limestone trade. Another vessel, the 51-ton schooner *Q. A. GILLMORE*, carried stone from the island for many years. She was owned by Erastus Huntington and her master, Captain Ort. Moore of Kelleys Island. This vessel reportedly leaked so badly that while in port the crew had to dump bushels of horse manure into the water around the ship to be sucked into the seams, thereby caulking the hull (Hills 1925:135). In 1881 the *Q. A. GILLMORE* was wrecked on Gull Island Shoal.

By 1888, KIL&T Co. had procured a fleet of five steam barges at a cost of \$140,000, including the *ALBERT Y. GOWEN* (Figure 25), *GOOD HIT*, *HANDY BOY*, *JIM SHERIFFS*, and *TEMPEST* for an aggregate tonnage of 3,200 (Nichols 1888:23). The steamer *JIM SHERIFFS* carried stone to Duluth while the steamer *ALBERT Y. GOWEN* transported lime to Cleveland and Detroit. Later, the steamers *DESMOND* and *ISABELLA J. BOYCE* were purchased for the Cleveland stone trade as was the steamer *NORMA* for carrying freight between Sandusky and Kelleys Island. The *NORMA* was later succeeded by the steamer *EDWARD P. RECOR*. In addition to these vessels, KIL&T Co. operated two steel barges and a tug, *L. P. SMITH*, to tow them to Cleveland loaded with limestone (Hills 1925:137). In 1913, KIL&T Co. operated a fleet of 10 vessels, consisting of wooden and steel barges, tugs, steamers, and sail-rigged craft that were used to transport the limestone (Ryall 1913:187).

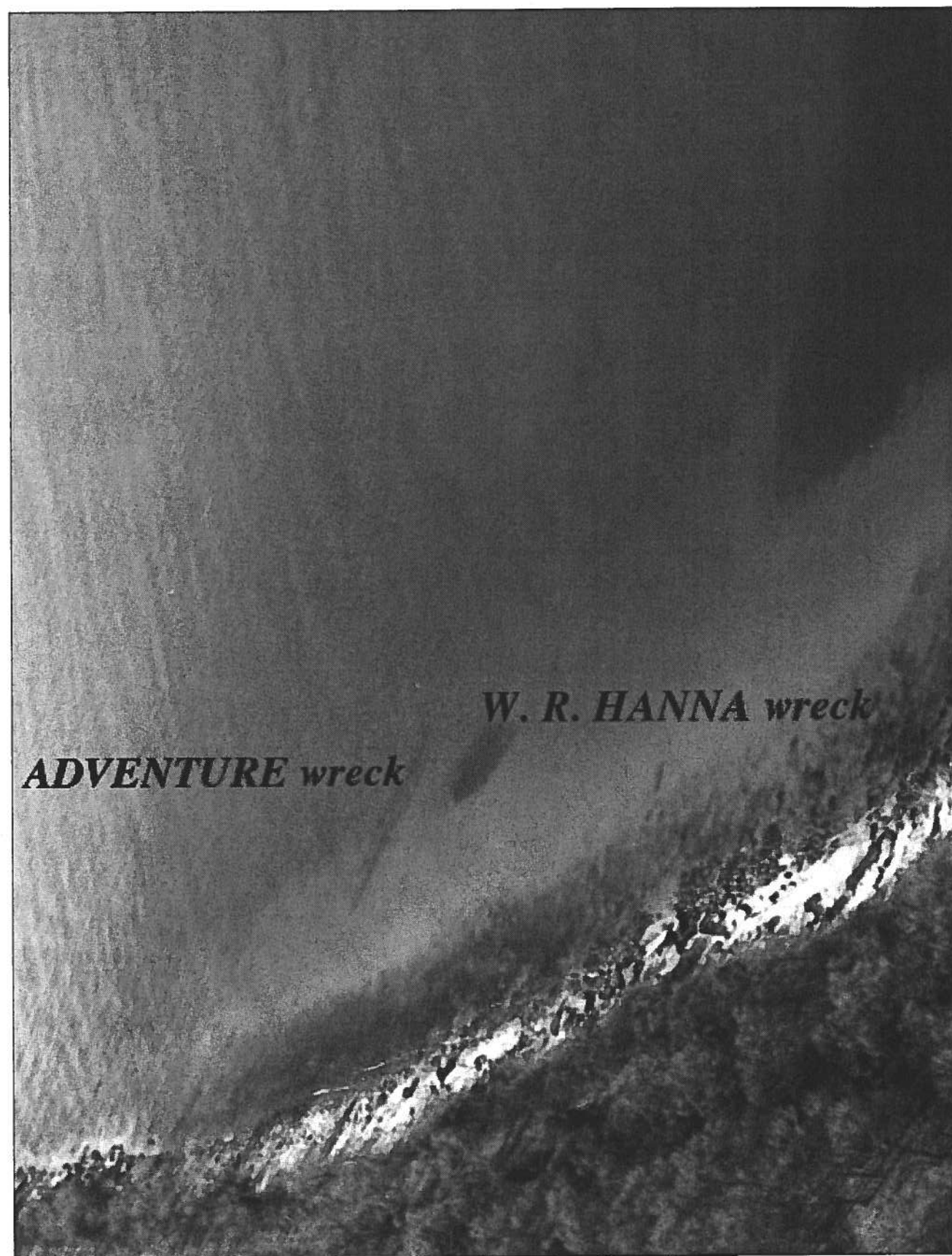


Figure 26. Aerial photograph of the North Bay shoreline of Kelleys Island showing the positions of the *ADVENTURE* and *W. R. HANNA* wrecks (photo by Thomas Kowalczyk).

## ARCHAEOLOGICAL SURVEY

### SURVEY METHODS

Although the wreck of the steamer *ADVENTURE* is relatively well known to sport divers of the western Lake Erie area, no serious efforts had been undertaken to document the features of this archaeological site. During fall semester of 1997, an experimental workshop course titled *Shipwreck Archaeology for Recreational Divers* was taught by the authors and several colleagues at Firelands College of Bowling Green State University in Huron, Ohio. The goals of the course were to train a cadre of avocational divers in the techniques of shipwreck documentation and then put these newly acquired skills to the test by conducting an archaeological study of the *ADVENTURE*.

The course was designed to: (1) foster an appreciation of Lake Erie's underwater cultural resources, (2) offer information on the construction of Great Lakes vessels, (3) provide insight as to the historical and archaeological significance of shipwrecks, and (4) give scuba divers training in underwater techniques for documenting shipwrecks. The experience was a blend of lecture, dry- and swimming pool-simulation laboratories, plotting exercises, and actual shipwreck site mapping. The workshop was sponsored by a grant from the Lake Erie Protection Fund and by in-kind services from the Great Lakes Historical Society and the Ohio Sea Grant College Program at The Ohio State University. The workshop gave a group of 38 students the opportunity to document the wreck of the *ADVENTURE*, which facilitated the preparation of detailed maps and drawings of the site presented in this paper, as well as allowing them to participate in the restoration of the vessel's propeller.

The location of the *ADVENTURE* shipwreck in North Bay of Kelleys Island was generally known (Figure 26), but as with all wrecks in Ohio waters, no record of any previous archaeological documentation was available. After locating the *ADVENTURE* site based on sports diver tradition, a general reconnaissance dive was performed to determine the basic orientation of the shipwreck and identify the major features to be mapped. Certain artifacts thought to have been removed through the years (most probably the boiler and engine parts by commercial salvagers soon after the sinking and the propeller in the 1960s by a diving club) were indeed found to be missing.

The primary documentation technique selected for the site was the trilateration method. This method required first establishing a baseline coincident with the keel of the vessel. This was accomplished by fastening a durable tape measure longitudinally along the entire length of the shipwreck and extending it some 10 to 20 feet beyond the bow and stern. Major features of the wreck selected for mapping were marked by attaching 2-inch x 2-inch plastic squares (cut from milk cartons) on which identifying numbers were placed with a water-resistant marker. Teams of divers were then sent to specific segments of the wreck to locate such features. The precise location for each significant point on the feature was achieved by recording the distance to that point from two positions on the baseline, thus forming a triangle with the feature at the apex.

Once the locations of the major features were determined, teams of divers were assigned specific details to measure and sketch (Figure 27). A

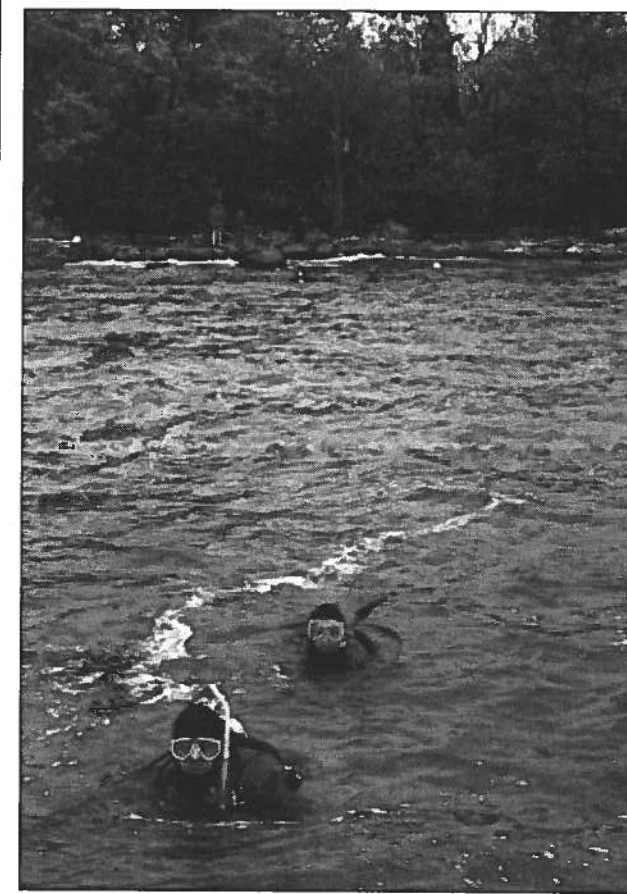


Figure 27. Workshop participants diving on the steam barge *ADVENTURE* shipwreck site (photo by C. E. Herdendorf).

preliminary site map was constructed in the field as the dive teams returned to the shore and reported their findings (Figure 28). Later, individual sketches were then integrated into an overall site map (Plate 1). To supplement this work, the site was imaged using a video camera fitted with a waterproof housing. The video recording was made with a right-angle vertical orientation, at a uniform distance of ten feet above the wreck, and along a predetermined grid to ensure thorough pictorial coverage of the entire site. The resultant footage was used to verify the manually-recorded site information and to fill in details which may have escaped the other documentation procedures.

sand mixed with gravel, limestone cobbles, and large glacial boulders. On this material, the remains of the *ADVENTURE* lay nearly horizontal with a slight cant toward the port side. A thin layer of zebra mussels (*Dresissena polymorpha*) and quagga mussels (*D. bugensis*) have colonized most of the exposed surfaces of the wreck, and small freshwater sponges (*Eunapius fragilis*) were observed in crevices. Patches of wild celery (*Vallisneria americana*) and coontail (*Ceratophyllum demersum*) were found all around the site, most of it four to six feet tall, as well as some thin growths of attached green algae (*Cladophora glomerata*).

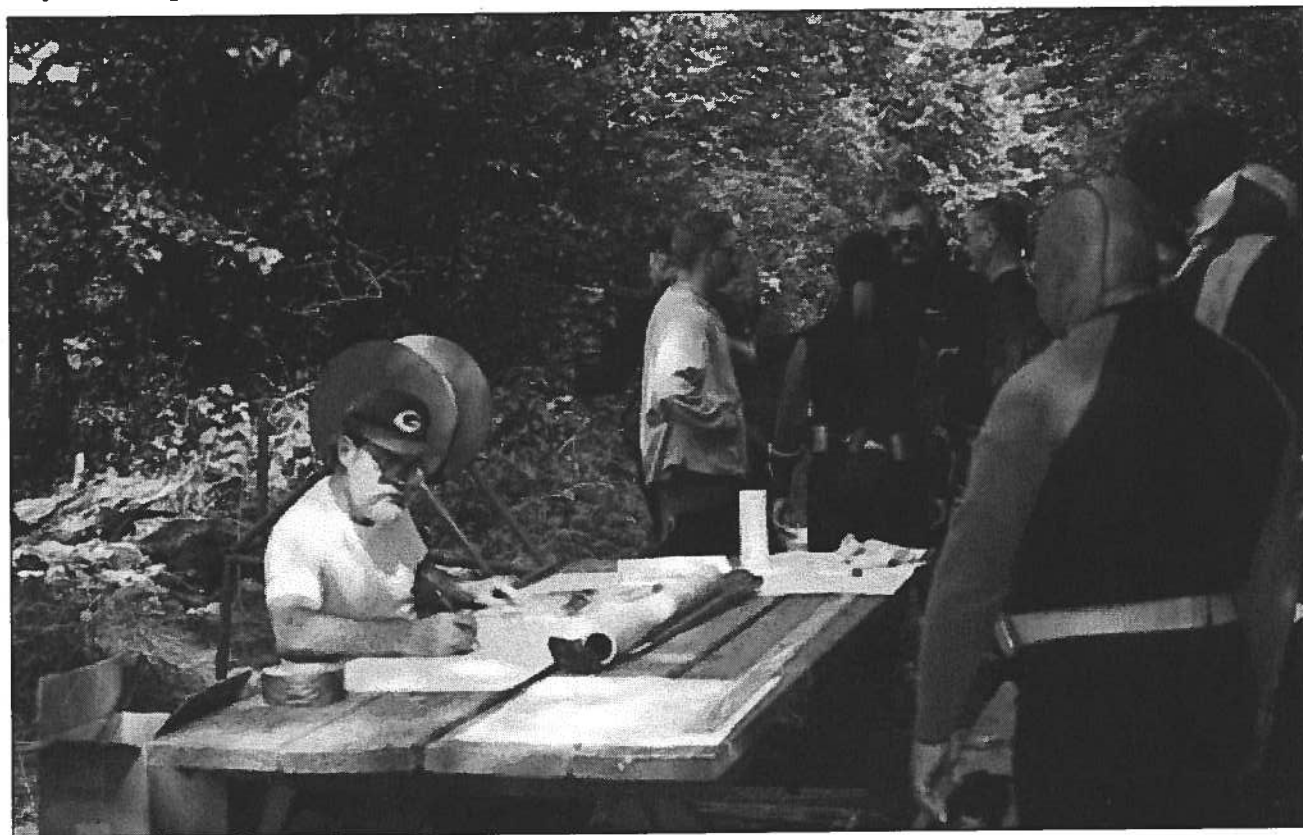


Figure 28. Workshop instructor compiling preliminary site map from diver reports (photo by C. E. Herdendorf).

## SURVEY RESULTS

The reconnaissance dive on the wreck site revealed that the shipwreck lays between 125 and 275 feet offshore in North Bay, about 3,200 feet southwest of the tip of Long Point (the nearest landfall from the wreck is about 525 feet northeast of the roadway gate to Long Point). The shoreline consists of shelving bedrock and low limestone cliffs. This type of landform is known as an alvar—a horizontal limestone terrain, laid bare by glacial action, which is maintained as a natural opening by constant waves and ice scour (Cusick 1997:3). Offshore the bottom consists of silty

The ship's hull is 102 feet long, extending from the sternpost to a point near the bow, with a maximum width of 24 feet. The wreck lies on a heading of N23°E, with the stern at the northern extremity, in depths ranging from 10 to 15 feet. The 19-foot stem and forefoot structure is detached and separate, lying 155 feet northwest of the forward end of the hull and 160 feet west of the sternpost, in approximately 18 feet of water (Plate 1). The position of the shipwreck components was determined using standard land surveying techniques once divers had placed buoys to mark the extremities of the sections. A 228-foot-long

baseline was established along the shore with its center near the projected offshore center of the site. Horizontal angles from the baseline to the various buoys were then measured with a theodolite. The position of the baseline was located in relation to the Long Point gate (visible on aerial photographs of Kelleys Island). This permitted the position of the shipwreck to be transferred to an aerial photograph (Figure 8).

Interestingly, a second shipwreck was observed very near the *ADVENTURE* site. About 50 feet southeast of the stern of the *ADVENTURE* are the remains of an 80-foot-long wooden scow schooner, laying along an east northeast axis, and laden with rough cut limestone blocks of irregular sizes. While this was at first believed to be part of the *ADVENTURE* wreck, its size and characteristics soon established that it was a separate but unidentified vessel. No attempt was made to document this wreck. Additional work on the second shipwreck in October 1998 revealed that it was the scow schooner *W. R. HANNA*, which sank in an October storm in 1886 (Labadie and Herdendorf 1999:5).

The remains of the steamer *ADVENTURE* are largely intact, although the fire that ended the ship's career reduced her hull to the waterline, and only her framing and bottom features survive to the present time. The hull is entirely white oak, and most of her structural features are well preserved and solid, although there are clear indications of the fire that consumed the remainder of the ship. The iron fastenings are also well preserved, as are numerous machinery parts. The ship's hull is characterized by a heavy oak backbone composed of several longitudinal keelsons, together with transverse ribs (frames), and longitudinal oak planking both inside and outside the frames (Figure 29). The wreck of the *ADVENTURE* has been designated as Ohio State Archaeological Site #33ER481 (41°37.085'N, 82°40.867W).

**Framing.** The backbone of the vessel is made up of four individual keelsons, each 9 x 9 inches in cross-section, with three fixed to the frames and a fourth "rider" keelson along the centerline on top. The outermost of the lower keelsons are reinforced by bands of  $\frac{3}{4}$ -inch iron 9 inches wide, running much the length of the hull, i.e. from position 53 on the baseline all the way forward to position 101. These reinforcing elements would have the effect of adding another oak keelson on each side (Inches 1962:32; Slyker

1958:11,12). The keel itself is far less significant than the keelsons. It is fixed to the underside of the frames, and it measures 9 inches in width and 5 inches in depth. The keelsons run from the sternpost all the way forward to the point where the forefoot and stem once connected, a length of 102 feet, although not all of the four individual members have survived intact. The framing structure is intact from the engine bed near the stern (14 feet forward of the sternpost) to a point some 83 feet forward; only portions of the lower keelsons extend the remainder of the hull's length.

The keel structure is pierced at mid-length by the trunk for a centerboard, which undoubtedly survived from the ship's schooner days, although centerboards were also used in many steam barges. Centerboards were basically a feature required in sailing vessels. They were a form of adjustable keel, used to keep a ship on course when a beam wind tended to drive the bow sideways, especially when the ship was "light" or without cargo (Barkhausen 1990:1-43; Cuthbertson 1931:235-237; Inches 1962:31; Wilson n.d.:40-42). The centerboard was lowered through a slot in the ship's keel, thus the opening or "trunk." *ADVENTURE*'s centerboard trunk was 33 feet long, extending from the 52-foot mark on the baseline forward to the 85-foot point. The trunk originally would have stood at least eight feet high, reaching right up to deck level (Figure 30). Its opening was 4  $\frac{1}{2}$  inches wide and 31 feet long. The centerboard itself was pivoted on a pin at the forward end of the trunk and raised by means of a small winch on deck with a chain leading to the after end of the board. No evidence of the pivot-pin was found in the wreck, but a portion of the winch was located in the starboard side of the wreck abreast of baseline point 65. In the way of the centerboard trunk, the ship's frames were strengthened by a third "futtock" extending outboard some four feet from the centerline, while the remainder of the ship's frames were made up of only two futtocks. The highest points of the centerboard trunk are presently no more than three or four feet from the ship's bottom due to fire damage and decades of erosion by water and ice.

The common method of fabricating ship's frames in 19<sup>th</sup> century America was to build them up or laminate them, using overlapping sections or futtocks (Estep 1918:35-44; Greenhill and Manning 1988:103-109). Each of *ADVENTURE*'s frames is 8 inches wide—made up of two, 4-inch-wide futtocks. The frames extend from rail to rail, right across the ship's

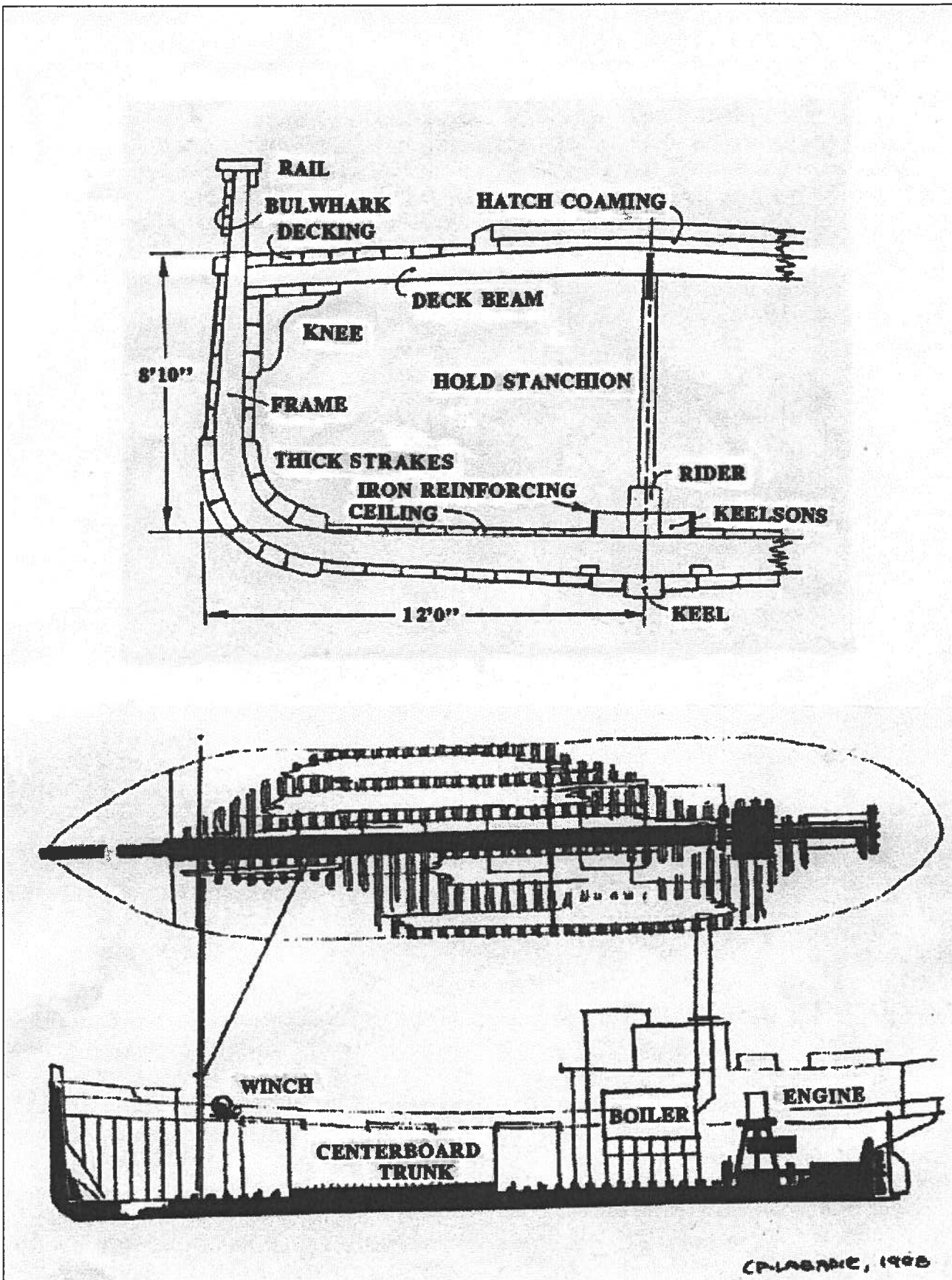


Figure 29. Reconstructed cross-section (above) of the ADVENTURE based on observations at the shipwreck site and reconstructed arrangement plan (below) showing the surviving features (darkened).

bottom, with the keelsons fixed to their upper surface and the keel underneath. They taper in their depth from 8 inches at the centerline to 6 inches at the bilge; although no frames have survived above the bilge-line, it is estimated that they would have been no more than 4 or 5 inches deep at deck level. The frames are spaced at 22-inch intervals, leaving 14 inches of space between adjacent frames. A frame spacing of 22 inches was typical in ships of the ADVENTURE's era, although with their 8-inch width, her frames are somewhat lighter than average.

One element of the ship's construction that is not entirely typical is the arrangement of the stern framing. Most wooden ships have "cant frames" at the ends, both forward and aft. These are half-frames which do not run continuously all the way across the hull of the ship, as do the frames in the midships portion of the hull, but instead they are fixed to either side of the stempost and the sternpost (Paasch 1890:14, appendix pl. 2). In the case of the ADVENTURE, the stern frames do run all the way across the hull, right through the "deadwood" at the sternpost. Instead of the more

common tapering of the "run" into the sternpost, ADVENTURE's hull is very full and round aft, with a flat underside and a projecting "skeg" sternpost. Although this configuration has been observed in other wooden ships, it is not common. Interestingly, in at least one other case where this pattern was observed, the steam barge SIDNEY O. NEFF, the vessel had originally been built as a schooner (Jackson 1983:107-114), like the ADVENTURE. It is assumed that this unusual method of framing the stern had to do with its transformation from the original square transom design of schooners to the round overhanging stern typical of steam vessels.

The ship's fastenings are typical of the period. Keelsons and frames are fastened together with 1-inch round iron "treenails." Frames have their individual futtocks fixed together with 3/4-inch treenails. Planking is fastened with a combination of 3/8-inch square nails and 5/8-inch round treenails; in the thick strakes, "clench rings" or "rove washers" are used on the treenails to make the fastenings doubly secure (Desmond 1919:58-61). Most of the fastenings in the

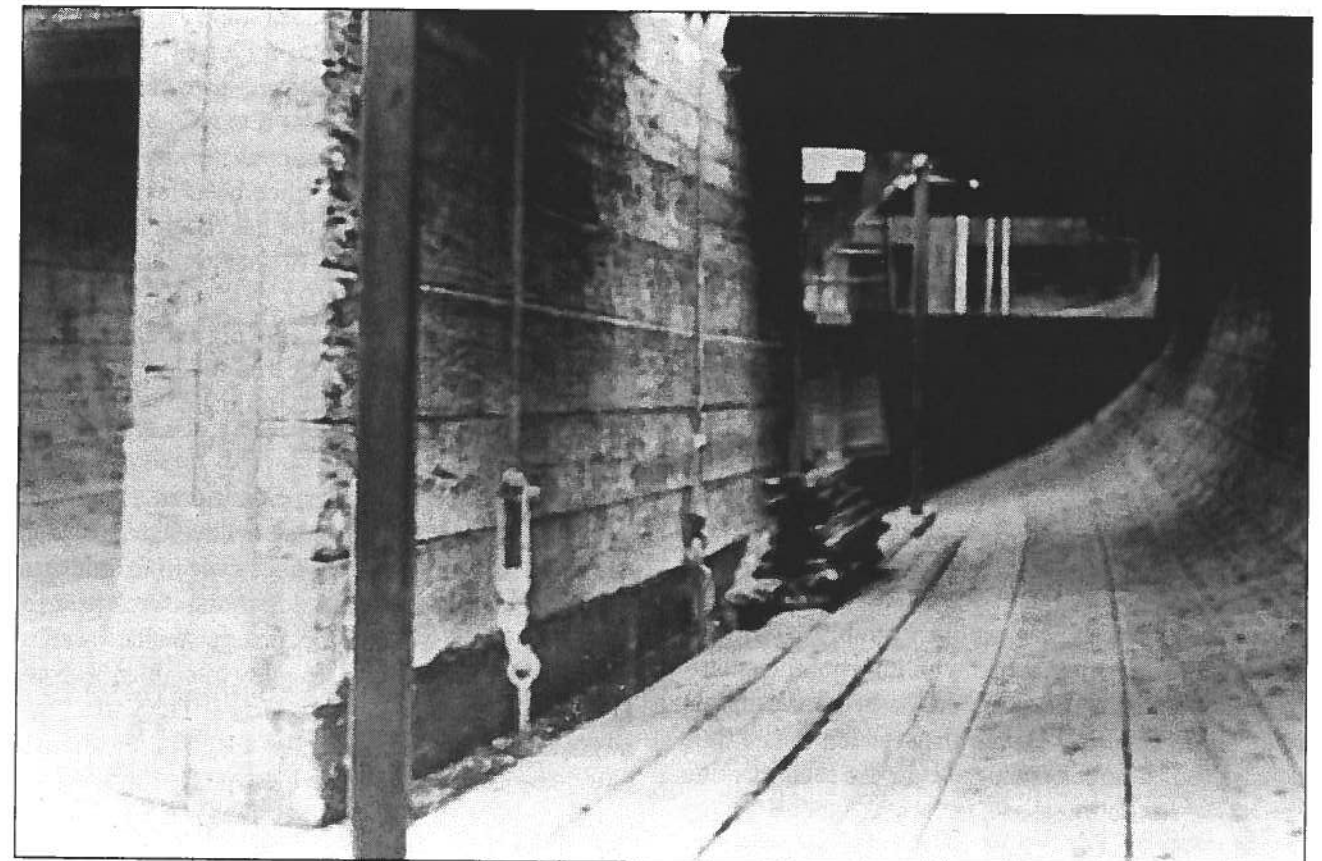


Figure 30. Photograph taken inside the hold of the 105-foot schooner ALVIN CLARK showing a prominent centerboard trunk extending from the keelsons up to the deck (C. P. Labadie Collection). Built in 1846 at Truago, Michigan, this vessel had a centerboard trunk similar to the one found in the ADVENTURE wreck.

*ADVENTURE* wreck are solid and little deteriorated. Few loose fastenings were observed, while most wooden vessels that suffered similar fire damage are littered with them; it may be assumed that through the years divers have removed many loose treenails, bolts, and nails.

At the forward end of the wreck, the stem has been separated from the keelsons where it was once attached, and it lies flat on the lake bottom some 155 feet away, with its bottom oriented roughly to the north and its upper end to the west. The stem is built up of several oak timbers. It is 19 feet long and tapers from 24 inches depth at the bottom to 15 inches depth at its top. The stem is "arcuate" or bow-shaped, forming an arc of approximately 75°. The upper portions of the stem are much deteriorated, and it is suspected that it suffered fire damage. The ends of several planks are still attached to the rabbet (groove) on the underside of the stem.

**Planking.** Like all of her contemporaries, the *ADVENTURE* was double-planked. She had 3-inch oak planking both inside and out, securely fixed to each frame with iron "treenails" and spikes (Desmond 1919:56-61; Estep 1918:64-71). The planking was from 8 to 14 inches wide and up to 40 feet in length. On the inside of her hull, the ship also had 4-inch "thick strakes" to reinforce critical areas (Desmond 1919:63). Thick strakes were bands of three or four planks at the turn of the bilge and just under the deck beams at the ship's sides; these bands of heavier planking acted as trusses to contribute longitudinal stiffness to the hull. Much of the exterior planking has survived as well as some of the interior "ceiling." A particular 60-square-foot area on the port side about 20 feet forward of the engine mount shows extensive fire damage. This is thought to have been the location of the coal-bunker, and it may have been the source of the fire that destroyed the ship.

**Machinery.** A very visible assembly at the stern of the ship is the engine bed with its adjoining shaft-log and sternpost. This structure is the most tangible remnant of the ship's power plant, which at one time consisted of a boiler, a single-cylinder reciprocating steam engine, crankshaft, tailshaft, propeller, and rudder, plus smaller engine-room auxiliaries (Figure 29). While the boiler is gone and the cylinder-head has been removed from the engine, numerous artifacts still remain in the wreckage, including broken castings,

bent rods and eccentrics, piping, and the ship's 5-foot-long condenser. The rectangular engine bed is built up of thick 12-inch oak timbers tied securely into the ship's keelsons and frames at a point some 15 feet forward of the sternpost, measuring 41 inches in length and 51 inches in width. The cast iron engine frame is detached, but laying on the port side of the vessel about 15 feet forward of the engine bed. Eight 1 1/2-inch studs used to bolt down the engine are still standing in the engine bed, but the nuts are all gone, perhaps indicating an effort to salvage the engine.

The distinctive cast-iron flywheel measures 3 1/2 inches in thickness and 26 inches in diameter; it stands at the forward end of the engine bed, still fixed to the crankshaft (Figure 31). The crankshaft itself, with its associated journals, piston rods, and eccentrics lies intact in its bearings, although all of the connecting rods are twisted and broken off. The crankshaft measures 6 inches in diameter. The tailshaft is still coupled to the crankshaft; it too, measures 6 inches in diameter and 12 1/2 feet in length from the coupling to the point where it has been cut off flush with the stern bearing at the after end of the sternpost. The tailshaft runs through a 9 1/2-foot oak shaftlog of 15 x 15-inch cross-section. The ship's 5-foot diameter, four-bladed, cast-iron propeller wheel was removed by divers in the 1960s, and while it was not at the site during the 1997 investigations, it has since been restored to its original position. The propeller has fixed "buckets" or blades. It is not clear whether or not it was also salvaged from the steam barge *HANDY BOY* when her engine was removed. The *ADVENTURE*'s rudder was not found, but the 1 1/2 inch thick iron rudder shoe is still fixed to the sternpost, with its trailing edge projecting 4 1/2 feet into the sand.

An interesting feature found in the ship's wreckage is a large iron casting believed to have been one of the support frames for a deck winch. This artifact was found on the starboard side of the wreck near the turn of the bilge, at the 66-foot position on the baseline. It is of heavy construction, roughly triangular in shape, and measuring 31 x 34 x 42 inches. The casting has numerous holes for bolts and shafts. The winch may have been used for mooring lines and for lowering and raising the ship's centerboard. A second large artifact associated with the wreck is the cylindrical condenser, which was observed laying near various engine parts on the port side at the 30-foot position on the baseline. This apparatus captured the steam exhaust from the

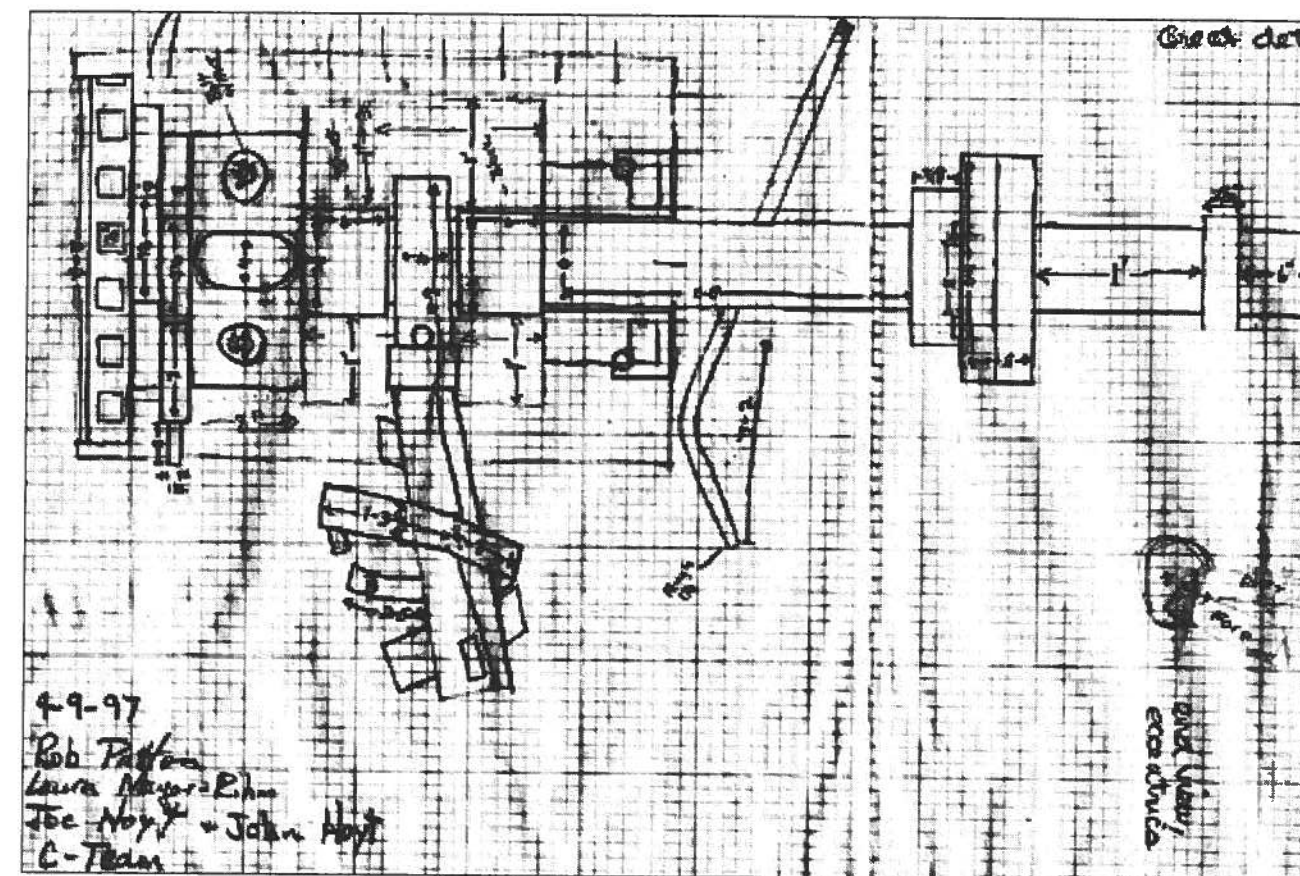


Figure 31. Example of field sketches made by Nautical Archaeology Workshop students during mapping exercise on steamer *ADVENTURE* site, September 8-9, 1997. Plan view of crankshaft and tailshaft assembly by Dive Team C (Rob Patton, Laura Mayer-Rihm, Joe Hoyt, and John Hoyt).

engine and turned it back into water by cooling it. The water was then recycled back into the ship's boiler. The condenser consists of a riveted-steel drum with steam piping coiled inside. The drum measures 18 inches in diameter and 60 inches in length. A third large artifact is the lower portion of the ship's main engine, which consists of a four-legged, cast-iron pedestal. This feature lays on the port side opposite the 40-foot position on the baseline, just forward of the condenser. It measures 42 inches in height and has an upper surface 2 inches thick and 32 inches square. The cylinder would have been fixed to this surface.

#### INTERPRETATION OF CARGO

In addition to the high quality of the stone, economical water transportation has been noted as a prime factor in the growth of Kelleys Island into the largest limestone producing center in Ohio and the lower Great Lakes region at the turn of the century (Orton and Peppel 1906:212). At that time Ohio limestone was sold by weight and a ton of dimension

stone was marketed between \$1.00 and \$2.00 a ton, whereas lump lime in barrels ranged from \$5.50 to \$6.00 per ton. In 1905 the cost of barrels ready to fill was about \$0.21 each. Barrels of "ordinary size" were used—15 1/2 to 16 1/2-inch heads and 28 1/2-inch staves. An empty barrel weighed 15 to 16 pounds and could hold 185 pounds net of lump lime or nearly 400 pounds of ground lime. The cost of producing a barrel of lump lime from quarry to loaded aboard a vessel was \$0.46, which included: quarrying and transport to kiln \$0.05, fuel \$0.07, labor \$0.09, fixed costs \$0.04, and barrel \$0.21. In 1905 the F.O.B. dockside sales price was about \$0.56 per barrel (Orton and Peppel 1906:232).

The net tonnage of the *ADVENTURE* following her 1897 reconfiguration was 95.37 (equivalent to 9,537 cubic feet), which yields an estimated cargo weight capacity of about 170 tons. The ship's final cargo was reported as lime, most probably packed in wooden barrels (Figures 32 and 33). Small accumulations of a grayish-white slurry were found in the ship's hull adjacent to the keelsons and

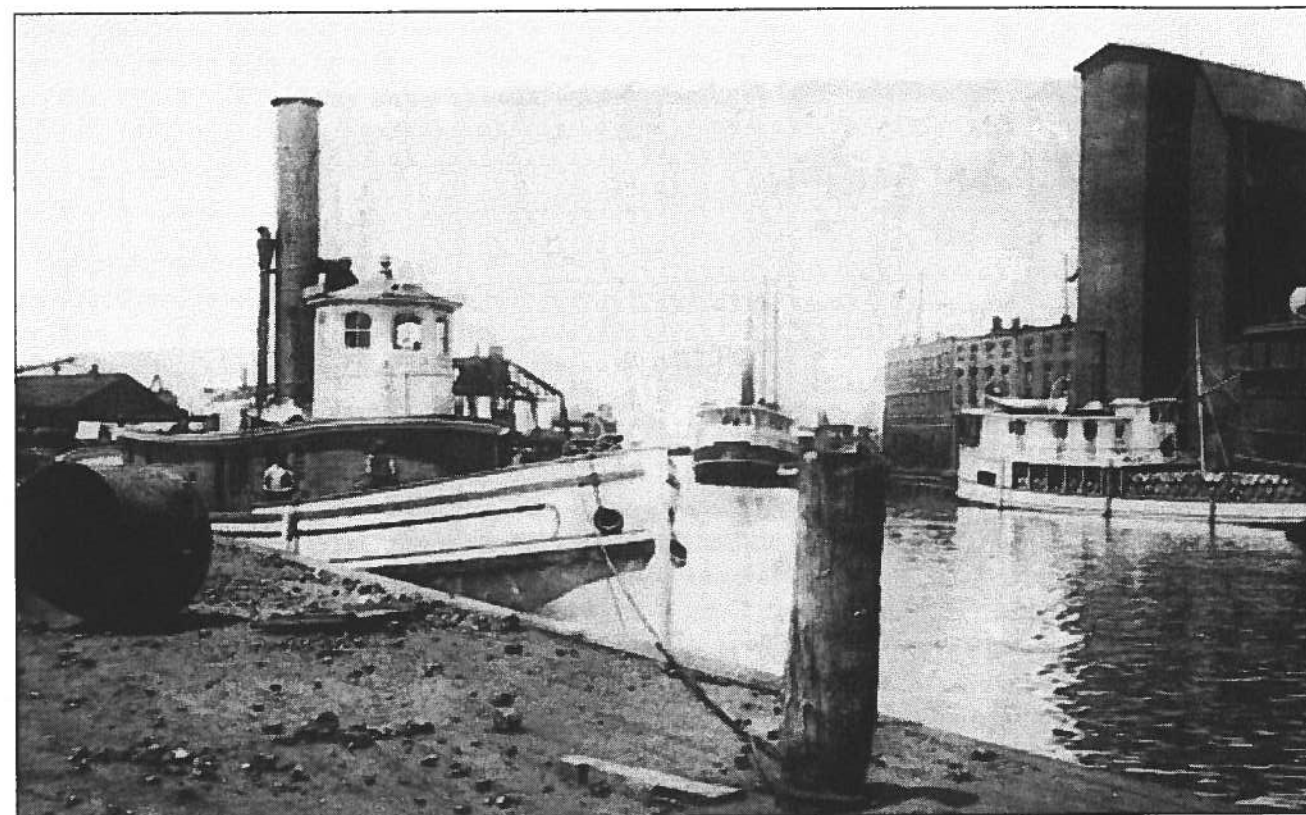


Figure 32. Cleveland Harbor, circa 1900 showing steam barge J. S. RUBY (right) loaded with barrels on her deck (courtesy of Western Reserve Historical Society). Note tackle used to off-load barrels. Other vessels shown include tug CONSTITUTION (left) and steam barge AZTEC (center).

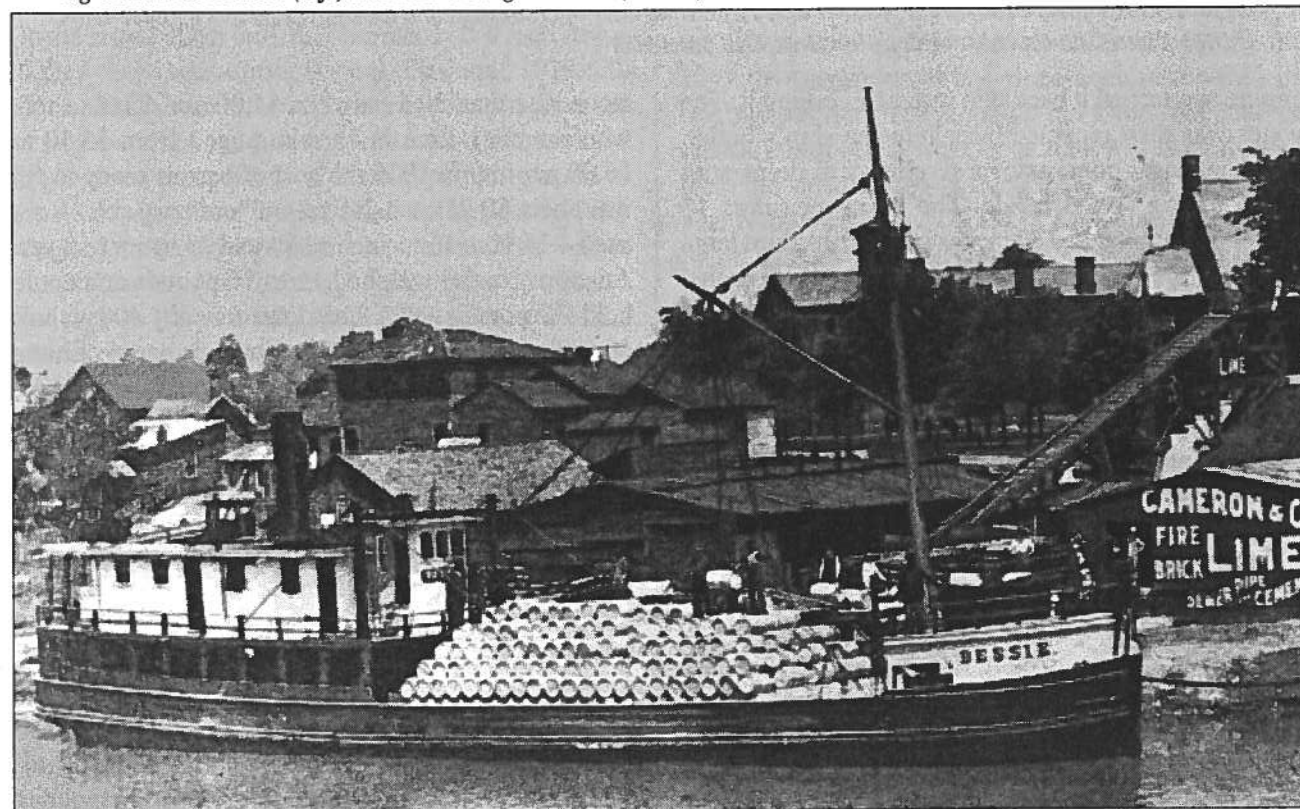


Figure 33. Steam barge BESSIE in the process of off-loading a full cargo of barrels (C. P. Labadie Collection). The ADVENTURE's final cargo of lime-filled barrels would have had a similar appearance.

approximately 20 feet forward of the engine bed. Samples were obtained from the site, and after drying, this material effervesced freely when drops of dilute hydrochloric acid were applied, suggesting that the samples represented the remnants of a lime cargo, perhaps the residue of numerous cargoes carried by the steamer. The hydrated lime deposits were found adjacent to the keelsons on the starboard side of the ship, but no evidence of barrels was noted, such as staves, iron hoops, or flat ends.

The precise size and capacity of the barrels produced at the KIL&T Co. cooperage has not yet been determined because physical evidence is lacking. However, some approximations can be given based on published material and period illustrations. Heisler (1987:533) gives the weight of a barrel of dry cement (mixture of calcined limestone and clay) as 376 pounds. Using the density of bulk quicklime (55 pounds per cubic foot), such a barrel would have a volume of 6.8 cubic feet or approximately 51 gallons (Eshbach 1952:146). Considering a 170-ton cargo capacity for the ADVENTURE, which equates to about 340,000 pounds, she could carry about 900 barrels. Volumetrically, allowing for a 20% loss of space for packing cylindrical barrels (Leeming 1942:431), a 900-barrel cargo would occupy 7,340 cubic feet or about 77% of the available 9,537 cubic feet of cargo space.

#### REPLACEMENT OF PROPELLER

The 1,600-pound propeller of the ADVENTURE was salvaged by the Poseidon Diving Club of Newark, Ohio in 1964. Divers from the club spent several weekends cutting the shaft by hand with hacksaws. The massive cast-iron propeller had four blades and measured five feet in diameter. For many years the propeller was displayed at the Newark YMCA as a trophy, welded to a flagpole. In 1992, the flagpole was dismantled and the propeller was relegated to a scrap pile behind the city maintenance garage in nearby Heath, Ohio. Detective work by workshop students Greg and Lynda Myers led to the recovery and eventual return of the propeller to the ADVENTURE shipwreck site in North Bay (Figures 34 and 35).

With the cooperation of the Poseidon Diving Club and the City of Heath Street Department, the propeller was released to the workshop project, loaded on a trailer, and transported to Lakeside, Ohio on October 17, 1997. The following day the propeller was

suspended from an A-frame mounted on the 45-foot-long salvage vessel CHARLOTTE MARIE (operated by Neil Shrock Towing and Salvage, Inc.) and escorted to North Bay of Kelleys Island by the rescue boat DIVE 1 of the Lakeside Fire Department. Arrangements for this phase of the replacement effort, including the donation of vessel and personnel time, was coordinated by workshop student Fred Rhoda.

At the shipwreck site, divers from the fire department, workshop participants, and instructor Joyce Hayward positioned the stern of the CHARLOTTE MARIE over the stern of the ADVENTURE and the propeller was slowly lowered to its approximate original position (one of the propeller's four blades had been lost during its period in the Newark area, but students learned of its possible location and plan to replace it on the shipwreck). This marks the first time a major artifact has been replaced on a shipwreck in the Ohio waters of Lake Erie and hopefully it is an action that will encourage divers to preserve Ohio's underwater heritage and perhaps return other artifacts to their original location on wreck sites.

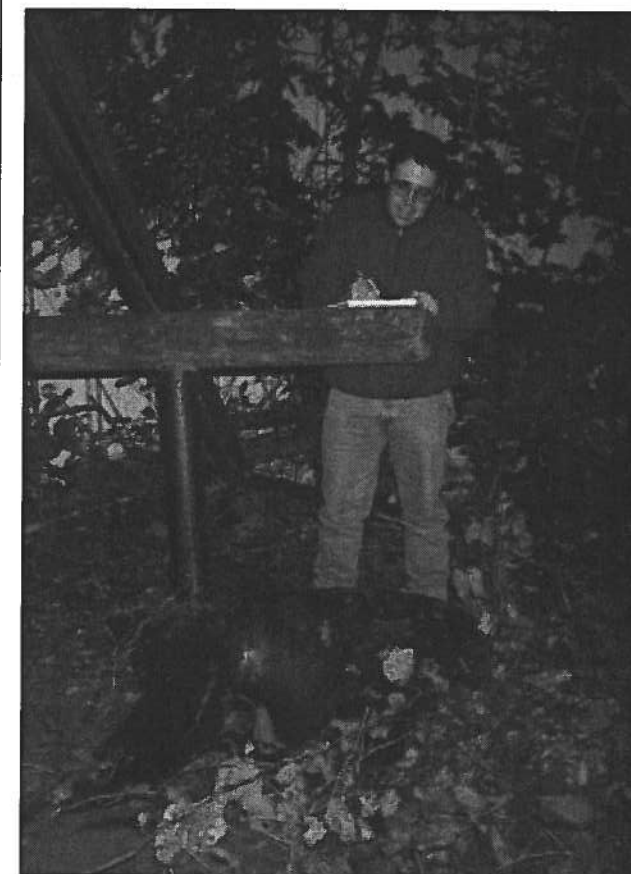


Figure 34. Discovery of ADVENTURE's propeller in a scrap pile at Heath, Ohio (courtesy of Columbus Dispatch).

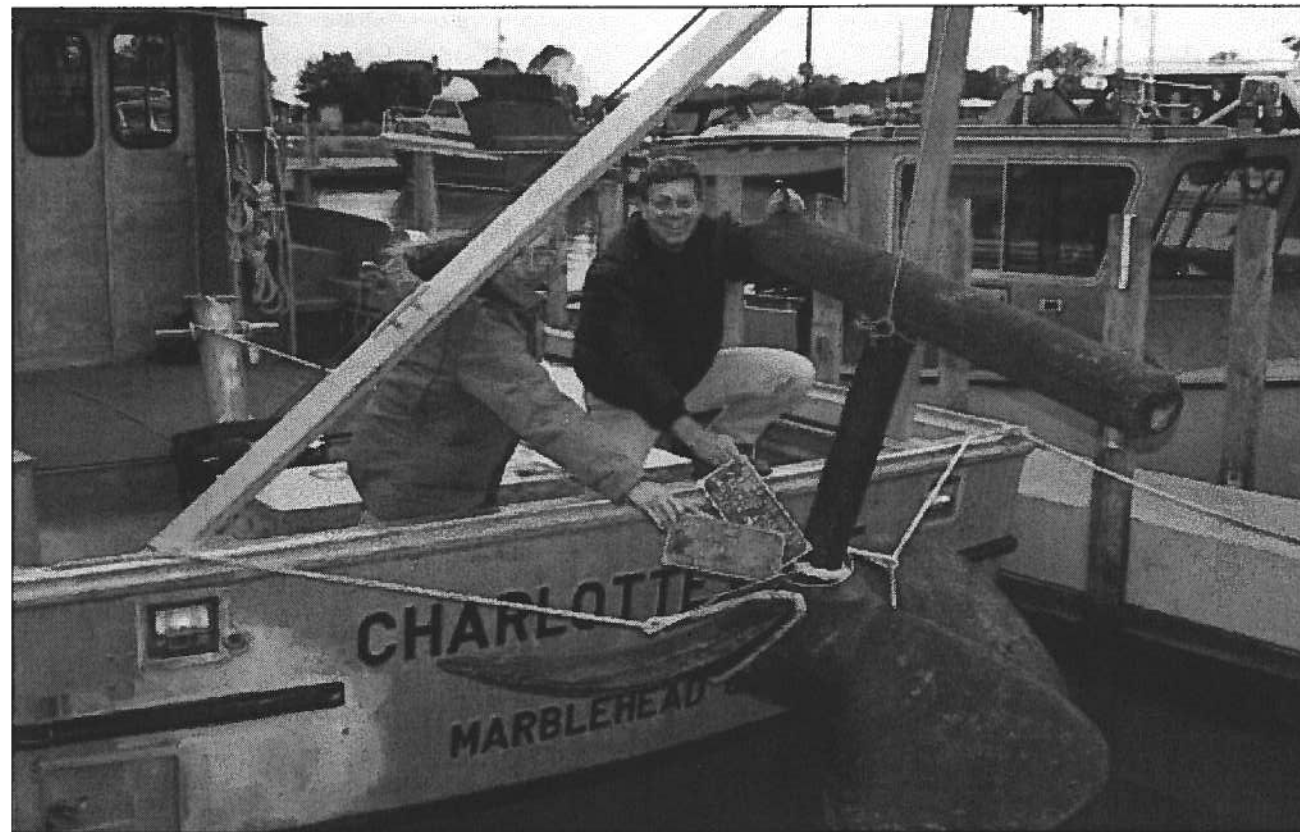


Figure 35. Cast-iron propeller being replaced on wreck of the steamer *ADVENTURE* after being missing for 33 years (photo by Ricki C. Herdendorf).

### CONCLUSIONS

The *ADVENTURE* was one of dozens of steam and sailing vessels that serviced the limestone industry of Kelleys Island in the late 1800s and early 1900s. Although the *ADVENTURE* was among the smaller vessels calling at the island, she was capable of carrying a cargo of 900 barrels of burned lime. However, the only known record of the *ADVENTURE* taking on a cargo at Kelleys Island is the day she caught fire at the lime kiln dock and sank in North Bay. The sinking took place in the midst of peak lime production on the island, a period when KIL&T Co. was one of the leading crushed limestone and lime producers in the world. Perhaps the high demand for lime products in 1903 was the reason the *ADVENTURE* was pressed into service to augment the vessels operated by KIL&T Co.

Archaeological investigations of the shipwreck site have provided a likely answer to the question of the fire's origin. Contemporary newspaper accounts mention both flames from the boiler and wetting of the lime as possible causes of the tragic fire. Because a large area on the port side of the vessel, forward of

the engine bed, shows extensive fire damage the first possibility is most likely. The fire-damaged area is thought to have been the location of the coal-bunker, therefore the bunker may have been the source of the fire that destroyed the *ADVENTURE*, and not wetted lime.

A number of research questions remain unanswered after the field investigations and data analysis, one of the most baffling being the fate of the 900 barrels of lime that were thought to be on board at the time of the sinking. Contemporary newspaper articles report that the vessel was fully loaded with a lime cargo and that the entire cargo was lost in the fire and subsequent sinking. Yet no evidence of any barrels, particularly their metal hoops, was found on the site. Open questions like these can only be answered by further documentation of the site and surrounding areas. Given proper training and supervision, recreational divers can undertake projects, such as the *ADVENTURE* documentation, that can contribute significantly to our knowledge of maritime culture, and at the same time be enjoyable and rewarding for the divers.

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Mr. Labadie is historian and exhibit coordinator at the Thunder Bay National Marine Sanctuary in Alpena, Michigan. He is the former Director of the U.S. Army Corps of Engineers' Lake Superior Visitors Center (formerly the Canal Park Marine Museum) in Duluth, Minnesota, a position he held from 1973 to 2000. He is well known in the Great Lakes region as a maritime historian and for his special interest in 19th century wooden shipbuilding technology. Mr. Labadie started his maritime career in 1960 as exhibits preparator and assistant to the Curator at the Dossin Great Lakes Museum in Detroit, Michigan. In 1968, he was appointed Director of the Saugatuck Marine Museum which is housed on board the retired passenger steamer *KEEWATIN* in Douglas, Michigan. Mr. Labadie has served as a consultant on submerged cultural resources and maritime history to numerous organizations, including the Great Lakes Historical Society, U.S. National Park Service, Minnesota Historical Society, Illinois Historic Preservation Agency, State Historical Society of Wisconsin, Michigan Department of Historic Preservation, and Tidewater Atlantic Research. Mr. Labadie is an active member of the Association for Great Lakes Maritime History and lectures widely on maritime topics.

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APPENDIX  
 CHRONOLOGY OF MERCHANT VESSEL ADVENTURE

**1875**  
*United States Enrollment*  
 October 1, 1875: Detroit, Michigan. Vessel enrolled as a schooner with one deck and two masts, plain head and a square stern. Built in 1875 at Detroit by John Oades, master builder.  
 Dimensions: 104.0 x 24.0 x 8.0 feet, 148.97 gross tons (139.86 below decks and 9.11 trunk cabin)  
 Owned by John Oades of Detroit (3/4) and Walter H. Oades of Detroit (1/4); Geo. H. Collins, master  
 Official number (US) 105567

**1876**  
*Board of Lake Underwriters*  
 New Tonnage 149  
 Where Built Detroit, Michigan  
 By Whom J. Oades  
 When Sept. 1875  
 Owners J. Oades  
 Port of Hail Detroit, Michigan  
 Value \$ 8,000  
 Class A2

**1877**  
*List of Merchant Vessels of the United States*  
 Y/E June 30, 1877, Merchant Sailing Vessels of the United States, &c.  
 Official No. 105567  
 Rig. Sch. [Schooner]  
 Tonnage 148.97  
 Home port Detroit, Michigan

**1878**  
*United States Enrollment*  
 April 2, 1878; Detroit, Michigan. Change owners to Edward Cunningham of Detroit (1/2) and F. B. Wallace of Detroit (1/2); Edward Cunningham, master

**1879**

**1880**

**1881**

**1882**

**1883**

**1884**  
*Inland Lloyds Vessel Register—SCHOONERS*  
 [Date 1884- not listed]  
 New Tonnage 149  
 Where Built Detroit, Michigan  
 By Whom J. Oades  
 When 1875  
 Owners Cunningham et al.  
 Port of Hail Detroit, Michigan  
 Value \$ 5,000  
 Class A2

**1885**

**1886**  
*United States Enrollment*  
 April 13, 1886; Detroit, Michigan. Change owners to Edward Cunningham of Detroit, Michigan (1/4), F. B. Wallace of Detroit (1/2), and J. E. Wallace of Chicago, Illinois (1/4); Edward Cunningham, master

*List of Merchant Vessels of the United States*  
 Y/E June 30, 1886, Merchant Sailing Vessels of the United States  
 Official No. 105567  
 Rig. Sch. [Schooner]  
 Dimensions 104.0 length, 24.0 breadth, 8.0 depth  
 Tonnage 148.97 gross, 141.53 Net  
 When built 1875  
 Where built Detroit, Michigan  
 Home port Detroit, Michigan

**1887**

**1888**  
*Twentieth Annual List of Merchant Vessels of the United States*  
 Y/E June 30, 1898, Merchant Sailing Vessels of the United States  
 Official No. 105567  
 Rig. Sch. [Schooner]  
 Gross tonnage 148.97  
 Net Tonnage 141.53  
 Length 104.0  
 Breadth 24.0  
 Depth 8.0  
 When built 1875  
 Where built Detroit, Michigan  
 Home port Detroit, Michigan

<b>1889</b>	
<b>1890</b>	
<i>Twenty-Second Annual List of Merchant Vessels of the United States</i>	
Y/E June 30, 1890, Merchant Sailing Vessels of the United States	
Official No.	105567
Rig.	Sch. [Schooner]
Gross tonnage	148.97
Net Tonnage	141.53
Length	104.0
Breadth	24.0
Depth	8.0
When built	1875
Where built	Detroit, Michigan
Home port	Detroit, Michigan
<b>1891</b>	
<i>United States Enrollment</i>	
February 13, 1891; Cleveland, Ohio. Change owners to H. C. Case of Sheffield, Ohio (1/2) and J. F. Padley of Sheffield (1/2); H. C. Case, master	
Tonnage: 148.97 gross tons and 141.53 net tons	
<b>1892</b>	
<b>1893</b>	
<b>1894</b>	
<i>United States Enrollment</i>	
May 25, 1894; Cleveland, Ohio. Change owners to H. C. Case of Sheffield, Ohio (1/4) and J. H. Padley of Sheffield (3/4); H. C. Case, master	
<b>1895</b>	
<i>United States Enrollment</i>	
April 11, 1895; Cleveland, Ohio. Change owners to J. H. Padley of Sheffield, Ohio (3/4), and J. M. Robinson of Lorain, Ohio (1/4); J. M. Robinson, master	
<i>Twenty-Seventh Annual List of Merchant Vessels of the United States</i>	
Y/E June 30, 1895, Merchant Sailing Vessels of the United States	
Official No.	105567
Rig.	Sch. [Schooner]
Gross tonnage	148.97
Net Tonnage	141.53
Length	104.0
Breadth	24.0
Depth	8.0

When built 1875  
 Where built Detroit, Michigan  
 Home port Cleveland, Ohio

**1896**  
*United States Enrollment*  
 February 4, 1896; Cleveland, Ohio. Change owners to J. M. Robinson of Lorain, Ohio; J. M. Robinson, master

*Sandusky, Ohio Newspaper* (Winter 1896)  
 (Personal communication, Gordon Wendt, January 26, 1998)  
 Newspaper reported that conversion of *ADVENTURE* to a screw steam was planned by the owners for the Spring of 1897 in Sandusky, Ohio. David Dussault, who operated shipyards at the Baltimore & Ohio Railroad dock (foot of Warren Street) and at the foot of Meigs Street in Sandusky, was mentioned as the probable shipbuilder to do the conversion work. The conversion was to take place after partial ownership of the vessel was transferred to the Groch Coal Company of 505 Water Street, Sandusky, Ohio, Frederick Groch, president. The steam engine was to come from the tug *HANDY BOY* and the boiler from the tug *MYRTLE* of Sandusky.

**1897**  
*United States Enrollment*  
 April 20, 1897; Sandusky, Ohio. Vessel rebuilt at Sandusky in 1897 as a screw steamer with one deck and two masts, plain head and a round stern; H. D. Root, master carpenter  
 Dimensions: 108.0 x 24.0 x 8.3 feet, 141.72 gross tons and 95.37 net tons  
 Owned by J. M. Robinson of Lorain, Ohio (1/2), and Frederick Groch of Sandusky, Ohio (1/2); J. M. Robinson, master

*Milwaukee, Wisconsin Newspaper* (May 3, 1897)  
 "During the past winter the schooner *ADVENTURE* was transformed into a steamer at Sandusky."

*United States Enrollment*  
 May 26, 1897; Cleveland, Ohio. Permanent document, vessel having arrived at her home port: A. C. Moss of Sandusky, Ohio (2/104), J. M. Robinson of Lorain, Ohio (51/104), and Frederick Groch of Sandusky (51/104); S. J. Batman, master

*Indorsements of Change of Master*  
 June 5, 1897, Cleveland, Ohio: Wm. H. McNalley present master in lieu of S. J. Putnam  
 June 8, 1897, Cleveland, Ohio: Geo. Best present master in lieu of Wm. McNalley  
 June 26, 1897, Port Huron, Michigan: John M. Robinson present master in lieu of Geo. Best

*Inland Lloyds Vessel Register—SCHOONERS*  
 Net Tonnage 142  
 Built of Wood  
 Where Built Detroit, Michigan  
 When Built 1875  
 Owners Cunningham et al.  
 Port of Hail Detroit, Michigan  
 Value \$ 1,500  
 Class A21/2

*Inland Lloyds Vessel Register*  
 —*SIDE WHEEL STEAMERS/PROPELLERS*  
 Supplement No. 2, June 1, 1897  
 Net Tonnage 95  
 Built of Wood  
 Gross Tons 141  
 Where Built Detroit, Michigan  
 When 1875  
 Owner Robinson et al.  
 Port of Hail Sandusky, Ohio  
 Value \$ 6,000  
 Class A2  
 Remarks Nee. Sch. [Schooner]

**1898**  
*United States Enrollment*  
 June 8, 1898; Sandusky, Ohio. Change owners to Frederick Groch of Sandusky; Frederick Groch, master

*Inland Lloyds Vessel Register*  
 —*SIDE WHEEL STEAMERS/PROPELLERS*  
 Net Tonnage 95  
 Built of W  
 Where Built Detroit, Michigan  
 When 1875  
 Rebuilt 1897  
 Owners Robinson et al.  
 Port of Hail Sandusky, Ohio  
 Value \$ 5,000  
 Class A21/2  
 Remarks Nee. Sch. [Schooner]

**1899**

**1900**  
*Inland Lloyds Vessel Register*  
 —*SIDEWHEEL STEAMERS/PROPELLERS*  
 Built of W  
 Gross Tons 141  
 Where Built Detroit, Michigan  
 When Built 1875  
 Re-built 1897  
 Bot'm Cl'k'd 1897  
 Owner [handwritten] Fred Groch  
 Port of Hail Sandusky, Ohio  
 Value \$ 1,500 [handwritten], \$ 5,000  
 Class B1 [handwritten], A1  
 Remarks Ref, 1897. Rec. To & Re. 1899 [handwritten] & Re. [strike-thru], New Dk.+ Re 1901

*Detroit Free Press*  
 Vessel Movement Reports:  
 June 19, 1900: *MAUMEE VALLEY* being towed by *ADVENTURE* – up bound on Detroit River  
 June 22, 1900: *ADVENTURE* and barge – downbound on Detroit River  
 July 12, 1900: *ADVENTURER* [sic] – cleared Sandusky with coal  
 July 13, 1900: *ADVENTURE* – upbound at Detroit

**1901**  
*United States Enrollment*  
 May 31, 1901; Port Huron, Michigan. Change owners to Charles Beyschlag of St. Clair, Michigan (1/3), Joseph Lowes of St. Clair (1/3), and Jno. Beyschlag, Jr. of St. Clair (1/3); Chas. Beyschlag, master

**1902**  
*Buffalo Morning Express* (June 15, 1902)  
 "Port Austin [Michigan], June 14. During the heavy fog last night the steamer *ADVENTURE* stranded five miles north of this point. She ran on a rocky bottom, but it is resting easily. The crew is now engaged in jettisoning a part of the cargo of alabaster [gypsum], and tugs have been sent for to release the steamer."

*List of Merchant Vessels of the United States*  
Y/E June 30, 1902, Merchant Steam Vessels of the United States

Official No.	105567
Rig.	St. s. [Steamer, screw]
Gross tonnage	141
Net tonnage	95
Length	108.0
Breadth	24.0
Depth	8.3
Service	I. f.
Crew	4
When built	1875
Where built	Detroit, Michigan
Home port	Port Huron, Michigan

1903

*Beeson's List of American Steam Vessels of the Lakes*

Rig.	do
Gross Tonnage	141
L'gth	108
Beam	24
Depth	8
Class	B 1
When Built	1875
Where Built	Detroit, Michigan
Owner or Manager	Chas. Beyschlag
Address of Manager	St. Clair, Michigan

*Detroit Free Press*

Vessel Movement Reports:

July 22, 1903: Steamer *ADVENTURE* – upbound at Detroit  
 July 31, 1903: Steamer *ADVENTURE* – upbound at Detroit  
 September 16, 1903: Steamer *ADVENTURE* – upbound at Detroit  
 September 20, 1903: Steamer *ADVENTURE* – downbound at Detroit, towing barge *MONTPELIER*

*Cleveland Plain Dealer* (October 8, 1903)

“BOAT AND CARGO A TOTAL LOSS.

Steamer *ADVENTURE* Destroyed by Fire at Kelleys Island.

All Members of the Crew Rescued

KELLEY'S ISLAND, O., Oct. 7 — The steamer *ADVENTURE* loaded with lime caught fire at 4 o'clock this afternoon while lying at the north dock. The tug *L. P. SMITH* towed the steamer away from the dock into shoal water. The steamer and cargo are a total loss. The prompt action of Capt. Regan of the tug *SMITH* in getting a line to the burning steamer and towing her out saved the schooner *ANDERSON* which was lying at the dock from burning also.

The *ADVENTURE* was owned by Beyschlag Schlinkert and Lowes of St. Clair. She was commanded by Capt. John Lowes who had his wife and little daughter on board. All including the members of the crew were rescued. The fire was first discovered just forward of the boiler in the hold.”

*Port Huron Daily Times* (Thursday, October 8, 1903)

“The steamer *ADVENTURE* caught fire while lying at the dock at Kelley's Is. on Wednesday afternoon with her cargo of lime and was totally destroyed. The fire originated near the boiler, when it was seen that the steamer could not be saved, she was taken in tow by the tug *SMITH* and pulled away from the dock in order to save the schooner *ANDERSON* which was lying dangerously near the burning craft. The *ADVENTURE* was owned by Beyschlag, Schlinkert and Lowes of St. Clair.”

*Sandusky Daily Register* (Thursday, October 8, 1903)

“*ADVENTURE* TOTAL LOSS

Steamer Burns at Kelley's Island.

Took Fire While Lying at Docks—Whole Crew Saved. The steamer *ADVENTURE*, loaded with lime, took fire at Kelley's Island at 4 o'clock Wednesday afternoon while lying at the north dock, and burned to the water's edge. Both cargo and vessel are a total loss, with no insurance. The tug *SMITH* towed the burning steamer into the lake, thus saving the schooner *ANDERSON* and the dock from burning also. Captain John Lowes was in command of the *ADVENTURE*. He had his wife and little daughter on board, but they, with the rest of the crew, were saved. It is not known how the fire originated. It was discovered in the hold just forward of the boiler, and spread so rapidly that the sailors were glad to escape with their lives. The burned steamer

was 108 feet long, 24 feet beam and 8 feet deep. She was built in 1875. The *ADVENTURE* was in port a day or two ago and discharged a cargo of salt at the Big Four docks. The vessel was formerly owned in Sandusky.”

*Sandusky Evening Star* (Thursday, October 8, 1903)

“STEAMER BURNED

Total Loss of the *ADVENTURE* at Kelley HAD NARROW ESCAPE

Captain and His Wife and Child Barely Reached Dock—Vessel is Towed to Shoal Water.

The steamer *ADVENTURE*, owned by Charles Beyschlag of St. Clair Mich., and whose master was Capt. John Lowes, was burned to the water's edge at Kelley Island about 4 o'clock Wednesday afternoon. The boat was loaded with lime, and was at the north dock. It is reported that the lime became wet and was set afire, but this report is not confirmed. The steamer and cargo are a total loss, and Captain Lowes, his wife and little daughter had narrow escapes from death.

The tug *L. P. SMITH*, towed the burning vessel into shoal water and thus saved the schooner *ANDERSON* from being set afire. The crew managed to escape, but most of their belongings were destroyed.

The *ADVENTURE* was formerly owned by Fred Groch, of this city, but he sold her about a year and a half ago. She is 108 feet long, has a 24 feet beam and is 8 feet deep. She was built in 1875.”

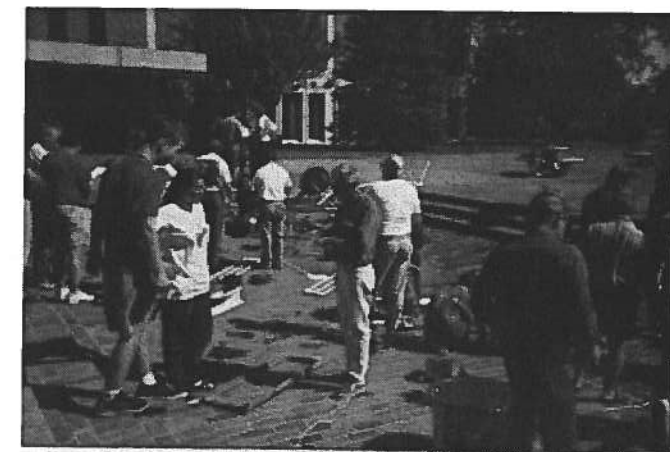
*United States Enrollment*

October 12, 1903; Port Huron, Michigan. Documents surrendered: burned; total loss at Kelleys Isl., Lake Erie, Oct. 7, 1903

1904

*Beeson's List of American Steam Vessels of the Lakes*  
Vessels Lost During Season of 1903

Propeller *ADVENTURE*, 141 tons, burned at Kelley's Island, Lake Erie, October 7th. Value of vessel, \$2,500, cargo \$1,500.



Nautical Archaeology Workshop participants practicing mapping techniques.

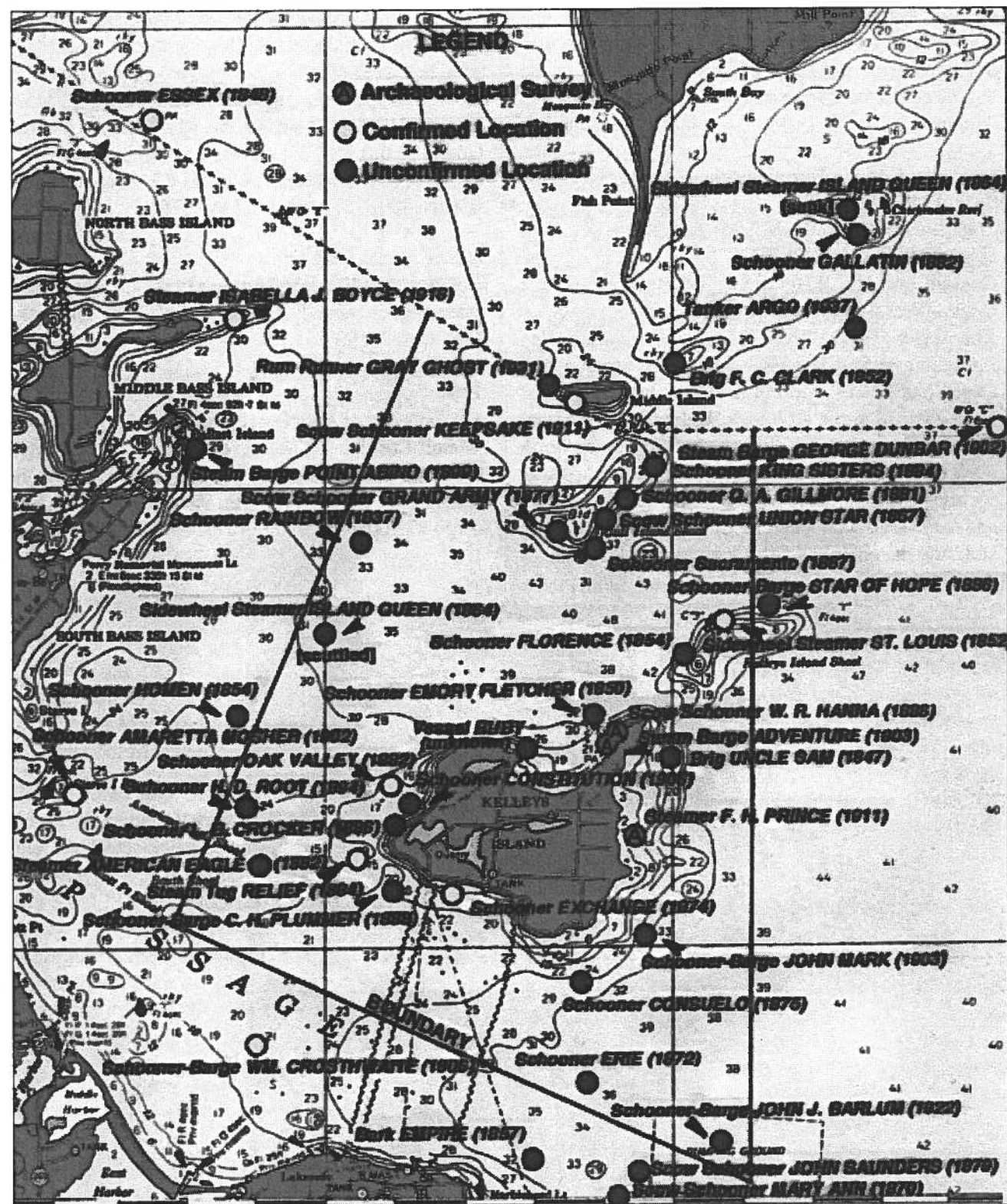


PLATE 1  
SITE PLAN OF STEAM BARGE ADVENTURE

Locations of shipwrecks and wrecking events in the eastern portion of the islands region of western Lake Erie, showing boundary of Kelleys Island Port Authority (base map from chart no. 14844, National Ocean Service, NOAA; illustration prepared by Charles E. Herdendorf).

# ADVENTURE Site Plan

